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H. C. 1826,

and professor in the University.

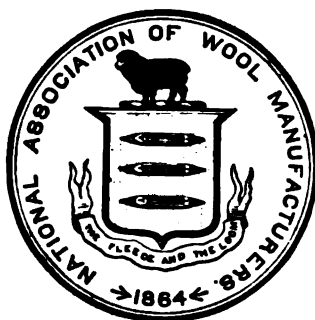
Received Oct. 16, 1893.





THE
AWARDS AND CLAIMS
OF
Exhibitors
AT THE
INTERNATIONAL EXHIBITION,
1876.

CONTAINING THE OFFICIAL AWARDS, WITH THE RESPECTIVE
CLAIMS OF EACH EXHIBITOR, AND THE GENERAL REPORTS
OF THE JUDGES IN THE DEPARTMENTS OF TEXTILE
MATERIALS, FABRICS, AND MACHINERY.



BOSTON:
NATIONAL ASSOCIATION OF WOOL MANUFACTURERS,
11 FENDERTON SQUARE.

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Messrs. A. P. Peabody

Oct. 1893.

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Press of John Wilson & Son.

P R E F A C E.

THE display at the Centennial Exhibition of the products of the American textile industry gave the opportunity, and made more apparent the necessity, of supplying a deficiency in our industrial literature, by a work which should give, in one department at least, the *personnel* of our principal manufacturing establishments, — their individual history, and the precise character of their products. The exhibits of the different branches of our textile manufactures in this department, grouped as they were together in the great hall of the Exhibition, brought into relief the unity of our textile industry, and suggested that it could be appropriately considered as a whole, and might be naturally separated from other groups of industries. The examination to which the exhibits were subjected by the general visitors, and especially by the examining judges, showed the avidity with which the most minute details were sought for in relation to the establishments making attractive and unexpected displays. Of the great mass of interesting information communicated to visitors by the exhibitors, no record remains, except in the traces of imperfect notes which may be found in the general reports of the judges. The official awards, brief and general as they are from necessity, instead of allaying, serve only to stimulate, curiosity.

The principal object of the present work is to supply, in the American department of the textile industry, what was unsaid or unrecorded at the Exhibition, in relation to the history and production of the establishments whose prominence was recognized by an official award, and to give in detail the facts establishing that prominence. This work is, therefore,

in its department a complement of the Exhibition: it reinforces and emphasizes its awards; it locates and describes those whom it has honored; it records information which it has made of public interest; and it more widely diffuses a knowledge of the judgments which the authorities of the Exhibition have pronounced upon the textile industry of the world, by placing all the awards in the textile department in a single volume, easily accessible to those interested in this special subject.

The descriptions of the establishments which are appended to the awards are called "claims," as no better word has occurred to express their principal object,—that of designating the distinctive facts in the history of the establishments or the qualities of their products "claimed" by the proprietors. The "claims" in all cases have been furnished or written by the respective proprietors; and the work, therefore, has the unique character of a collection of autobiographies of the American textile manufacturers whose eminence has been established by the highest possible official recognition. The importance of these purely original and authoritative contributions, which will hereafter serve as memoirs for a comprehensive history of American industries, will be equally appreciated by practical men and scholars.

A large portion of the work is occupied by the general reports of the judges at the Exhibition, which will speak for themselves. They comprise all the reports in the textile department. Their individual value, it is believed, will be enhanced by their being grouped together as they are in this volume, while the opportunity for verifying or correcting them is afforded by the descriptive claims.

JOHN L. HAYES,
Editor.

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AWARDS AND CLAIMS.

PACIFIC MILLS, LAWRENCE, MASS.

A W A R D.

PRODUCT: Printed Calicoes, Lawns, and Percales.

Commended for taste and variety in design, clear colors and sharp printing, especial excellence in lawns and percales.

J U D G E S.

EDWARD ATKINSON.
HUGH WADDELL, JR.
EDWARD RICHARDSON.
A. D. LOCKWOOD.
CHARLES H. WOLFF.
SAMUEL WEBBER.
GEORGE O. BAKER.
ISAAC WATTS.

W. W. HULSE.
DON ALVARO DE LA GANDARA.
ARNOLD GOLDY.
GUSTAV HERRMANN.
JOSEPH DASSI.
MENI RODRIGUES DE VASCON-
CELLOS.

The Pacific Mills are located in Lawrence, Mass., on the Merrimack River, 26 miles from Boston. They were started by the Essex Co., Hon. Abbott Lawrence being President, and Mr. J. S. Young Treasurer. They were incorporated in 1853 under the present name with a capital of \$2,000,000, for the purpose of making ladies' dress goods from wool wholly, from cotton wholly, and from wool and cotton combined, and were provided with all the appliances of manufacture, including print and dye works. The construction of the works having exceeded the amount of capital paid in, the establishment found itself in the very first years of its existence, on the brink of failure. This failure was arrested by the munificence of its President, Mr. Lawrence, who on his private responsibility advanced several hundred thousand dollars to meet the emergencies of the mill, thus adding to his title for recognition as one of the great founders of the manufactures of New England. A hardly less important work of Mr. Lawrence was the securing for the Treasurership of the mill vacated by the declining health of Mr. Young the services of Mr. J. Wiley Edmands, who had been educated in his house. Mr. Edmands took the Treasurership and the responsible management of the mill in June, 1855. For the subsequent two or three years, the establishment, although actually making money, was only sustained by largely borrowing money. In 1857, the leading commission houses of New England succumbed under

the pressure of the well-known panic of that period. The Pacific Mills were compelled to ask an extension of credit for six months, to which every creditor assented. In 1858, the stockholders were called upon to furnish an additional capital of \$500,000, of which all but \$75,000 was secured. The stock representing this amount not secured was sold at public auction in 1859 from \$1,320 to \$1,342 per share, the par value being \$1,000; although in 1857, two years previously, many shares had been sold at prices ranging from \$75 to \$200. During the first year of the war, 1861, the mill lost money, its product then being about 11,000,000 yards of dress goods, cotton and woollen. In 1870, the product reached 45,000,000 yards, and for several years since that date the sales, including the cloths purchased for printing, have reached about 65,000,000 yards. Of this, about 60 per cent are stuff or worsted goods. Estimating our population at 45,000,000, and that one-third of this population 15,000,000 consists of women and girls, the Pacific Mills, which has all its consumption at home, supplies not less than four yards of dress goods to each person of our population wearing these fabrics. The following statistics of this mill will give a better idea of the magnitude of its operations:—

Number of mills and buildings	12
Acres of flooring in buildings	41
Cotton spindles	135,000
Worsted spindles	25,000
Number of looms	4,500
Pounds of cotton used per week	116,000
Pounds of fleece wool used per week	65,000
Yards of cloth printed or dyed per week, more than	1,000,000
Printing machines, from 2 to 16 colors	24
Tons of coal used per year	23,000
Number of steam boilers, in all 32,000 horse power	50
Steam engines, 1,200 horse power	37
Turbine wheels, 2,000 horse power	11
Cost of gas per year, 5,000 burners	\$35,000
Cost of labor, per month	\$160,000
Average daily earnings, women and girls	98 cents
" " " men and boys	\$1.40
Persons employed, women and girls	3,534
" " men and boys	1,766
	5,300
Number of houses for work-people	275

To this it may be added, that the raw materials for dyeing, etc., require an annual expenditure of \$400,000; the consumption of potato-

starch is 500 tons a year, or 125,000 bushels of potatoes; the wool consumed requires the fleeces of 10,000 sheep each week; while to all these is to be added the food and clothing of 5,300 operatives, and their dependants twice as many more, and the items of transportation of raw material and manufactured products. Considering these multiform relations, how vast is the wave of production set in motion by the wheels of a single mill! and how broadly extended are its ever-enlarging circles, for the materials of consumption above enumerated show that the productive stimulus of this industrial centre moves labor not only in the fields of the South and the pastures of the West, but in the plains of India, the forests of Brazil, and the islands of the Equator.

The extraordinary success of this mill, although formed by the circumstances of the times, is to be attributed mainly to its command of the almost unequalled faculties of administration possessed by its Treasurer, Hon. J. WILEY EDMANDS, now deceased, and to its fortune in having as a selling agent Mr. JAMES L. LITTLE, whose mercantile sagacity was supplemented by a creative taste, which he has imparted to all the fabrics of the mills.

Not less conducive to its success was the enlightened regard to the higher social obligation in industrial enterprise which distinguished the earlier founders of that New England manufactory. The Company has never ceased its care for the welfare of its operatives, and their improvement morally and intellectually. It early founded a library, with reading rooms, which contain nearly 7,000 volumes, which is open to the work-people and their families, and has actually an average of 700 daily readers. It has also established a relief society for work-people temporarily ill, to which operatives and Company contribute; as well as a "Home," or hospital, provided with physicians and matrons, where those seriously ill can be better provided for than in the boarding-houses, or even their own homes.

As the result of this recognition by the Company of its moral responsibilities, there has been no disposition on the part of its operatives to organize strikes, all difficulties which have arisen having been amicably arranged.

This moral work of the Company was suitably recognized at the Paris Exposition of 1867 by the tribute to the Company of one of the awards granted, from five hundred contestants, to the individuals or associations "who, in a series of years, had accomplished the most to secure a harmony between employers and their work-people, and most successfully advanced their material, intellectual, and moral welfare."

The very extensive exhibit from the Pacific Mills at the International Exposition was not for purposes of competition, but simply to show the range and character of their product. It elicited the most unqualified commendation, more especially from the Judges from abroad, who were astonished at the extent and perfection of its fabrics.

President.

JOHN AMORY LOWELL.

Directors.

JOHN AMORY LOWELL.

GEORGE W. LYMAN.

J. HUNTINGTON WOLCOTT.

ABBOTT LAWRENCE.

BENJ. E. BATES.

JAMES L. LITTLE.

JAMES MCGREGOR (deceased).

AUGUSTUS LOWELL.

J. WILEY EDMANDS (deceased).

Treasurer.

J. WILEY EDMANDS (deceased).

Treasurer pro tem.

JAMES L. LITTLE.

Clerk.

HENRY DAVENPORT.

Selling Agents.

JAMES L. LITTLE & Co., Boston and New York.

AMOS R. LITTLE & Co., Philadelphia, Pa.

WILLIAM WOOD & CO., PHILADELPHIA, PA.**A W A R D.****PRODUCT: Cottonades and Cotton Cassimeres.**

For excellence in styles, comprising a very large assortment; imitation of fine woollen cassimeres very good; superior fabric, durability, economy.

J U D G E S.

EDWARD ATKINSON.
 HUGH WADDELL, Jr.
 EDWARD RICHARDSON.
 A. D. LOCKWOOD.
 CHARLES H. WOLFF.*
 SAMUEL WEBBER.
 GEORGE O. BAKER.
 ISAAC WATTS.

W. W. HULSE.
 DON ALVARO DE LA GANDARA.
 ARNOLD GOLDY.
 GUSTAV HERRMANN.
 JOSEPH DASSI.
 MENI RODRIGUES DE VASCON-
 CELLOS.

C L A I M.

The firm of William Wood & Co., manufacturers of cotton and woollen goods, and proprietors of the Pequea and Mount Vernon Mills was established in 1858 by William Wood, a son of Thomas Wood, proprietor of the celebrated Fairmount Machine Works, in this city. The new enterprise rapidly increased, compelling Mr. Wood's removal in 1860 to a building known as the Mount Vernon Mills, situated at Twenty-Fourth and Hamilton Streets, which building still forms a part of the present factories. In the year 1861, Mr. Wood associated with him in partnership Mr. John McGill, and the firm became known as William Wood & Co., a style which they retain to the present day. In 1867 they purchased the lot of ground extending from Twenty-First to Twenty-Second Street, and from Hamilton to Spring Garden Street, upon which they erected six buildings, covering four acres of ground. The original building, known as the Mount Vernon Mills, is a spacious structure 100 feet square, and three stories in height. The new works, which bear the name of the Pequea Mills, comprise six extensive buildings, and cover the area of ground above mentioned. Of these buildings the one used for storage, stock-rooms, and repair shops is two stories in height, 260 feet in length, and 60 feet in width. The dye-house is 180 feet long and 70 feet wide, and the spinning and carding department is in another build-

* Signing Judge.

ing four stories high, 200 feet long, and 60 feet wide. The weaving and finishing are done in a five-story building 280 feet long, and 42 feet wide, and the preparing department is a one story building 130 feet long and 70 feet wide. A fireproof storage building, two stories high and 60 by 40 feet in dimensions, concludes the list. In these large mills over 700 hands are constantly employed. The machinery includes 650 looms and spinning machinery, together with all the necessary appliances. The products of the mills are cottonades and cotton cassimeres in every variety of style, weight, and price, which, being used for clothing by the masses of the people, find a ready sale. Wool and worsted mixture suitings of various styles for the clothing and jobbing trade, superior jeans, plaid flannels, and shawls — the latter being long, square, and shoulder styles — are also manufactured. Immense quantities of these goods are produced and shipped to every part of the United States, Canada, Mexico, and South America. This necessitates a large consumption of raw material, nearly all of which is purchased from first hands, — the cotton in the Southern, and the wool in the Western States. The firm sell their goods directly to jobbers. They are the largest individual manufacturers of cottonades in this country, and are now preparing a larger variety than ever heretofore of these goods, together with cotton cassimeres suitable for all markets, to meet the wants of the coming season. The firm had two handsome and interesting exhibits of their goods at the Centennial Exposition, including double-twist and fancy cottonades, and also plaid flannels, for which they received the highest award of a medal and diploma for superiority of manufacture and extra quality, thus sustaining the high popularity which has for many years been accorded them by the trade of all markets. A large case of the finished goods was displayed in the Main Building, where they attracted much attention. In Machinery Hall they kept running continuously four looms, upon which were manufactured, in the presence of visitors, the different fabrics produced by the firm. This novel display attracted much attention at the Centennial.

HARTFORD CARPET COMPANY, HARTFORD, CONN.**A W A R D.****PRODUCT: Carpets.**

A capital exhibit of Brussels and two and three ply ingrain carpets, all of the best fabrication, the designs original and tasteful, and the colors clear and bright; the material and texture indicating high wearing qualities. The exhibit is illustrative of a vast production.

J U D G E S.

JOHN L. HAYES.

ELLIOT C. COWDIN.

CHAS. LE BOUTILLIER.

CHAS. J. ELLIS. *

J. D. LANG.

CONSUL GUSTAV GEBHARD.

THEODORE BOCHNER, Jr.

HENRY MITCHELL.

Dr. MAX WEIGERT.

LOUIS CHATEL.

CARL ARNBERG.

HAYAMI KENZO.

JOHN G. NEESER.

AUGUST BEHMER.

ALBERT DANINOS.

The Thompsonville Manufacturing Company was incorporated 1828, and commenced manufacturing carpets in 1829, and was the first to manufacture Brussels carpets in this country. The Hartford Carpet Company succeeded them, in 1854, in the manufacture of Brussels, two and three ply ingrain, and Venetian carpeting. In 1856 they purchased the Tariffville Manufacturing Company's works, and succeeded them in the manufacture of Brussels and two and three ply ingrain carpeting. In 1867, the mills at Tariffville were destroyed by fire. They immediately increased their works by additions equivalent to their loss; and now have at Thompsonville 247 two and three ply ingrain power-looms, with all necessary machinery for preparing the wool for weaving, and substantial and convenient dwellings for all their operatives.

The chief lines of goods made by the Hartford Carpet Company are body Brussels, extra three-plys, imperial plys, superfine, and medium superfine.

The date is very recent since the American public would believe that carpets of fast colors, good wearing qualities, and tasteful designs,

* Signing Judge.

could be made in this country; while abroad the current of opinion has been entirely changed by the revelations of the Centennial, it having there been clearly demonstrated in all the above qualities portions of the American exhibit were not only equal, but excelled, the samples from abroad.

One of the most distinguished of the English judges, standing amid the carpets of the Hartford Company's exhibit, said, "I had supposed our home manufacturers were acquainted with and catered to an exclusively American taste, which, judging from the samples shown by them here, would be any thing but popular in England. I find I am mistaken; for the fabric, colors, and designs of this exhibit are the equal, in all respects, of goods made for the best trade we have in our home markets."

While this was highly complimentary to our goods, we believe it was a just recognition of our industry to-day. Certainly, ample pecuniary means are at our disposal. We buy the best raw material, conform to the most cultivated tastes in our designs, command the highest order of skilled labor in all departments, make it a special point to secure fast colors, and are determined to maintain no lower standard of excellence, in all particulars, than we have achieved in the past; while our tariff of prices will compare favorably with those of any other factory whose goods are of similar make with our own.

We refer with a just pride to the recognition of the merit of our manufactures as shown in the above award.

Capital, \$1,500,000.

JOHN L. HOUSTON, Resident Agent at the mill in Thompsonville.

GEORGE ROBERTS, Treasurer and President, Hartford, Conn.

REUNE MARTIN, Agent, 114 and 116 Worth Street, New York.

BEL AIR MANUFACTURING CO., PITTSFIELD, MASS.**A W A R D.****PRODUCT: Fancy Cassimeres.**

An admirable exhibit of fancy cassimeres of bold and novel designs, in great variety, and of excellent manufacture.

J U D G E S.

JOHN L. HAYES.
ELLIOT C. COWDIN.
CHARLES LE BOUTILLIER.
CHARLES J. ELLIS.*
J. D. LANG.
CONSUL GUSTAV GEBHARD.
THEODORE BOCHNER, Jr.
HENRY MITCHELL.

Dr. MAX WEIGERT.
LOUIS CHATEL.
CARL ARNBERG.
HAYAMI KENZO.
JOHN G. NEESER.
AUGUST BEHMER.
ALBERT DANINOS.

This enterprise was started in the summer of 1873, under the management of Hon. Edward Learned, President, Frank E. Kernochan, Treasurer, and E. McA. Learned, Secretary. Although the crisis of that year had seriously affected the market before a yard of goods was ready for sale, and although the long-expected reaction has not yet begun, the success of the new company has already been marked and satisfactory. To its original intention of making fine fancy all-wool cassimeres, in all respects equal to the best products of foreign looms, it has steadfastly adhered; and, under the able superintendence of Mr. John Sunderland, has presented to the trade, each year, more than three hundred styles of spring and fall cassimeres and suitings, which, in the beauty and novelty of their designs, the perfection and permanency of their colors, the firmness and solidity of their fabric, the smoothness and evenness of their finish, cannot be surpassed. As

* Signing Judge.

a natural result, this youngest of American cassimere mills has already taken rank among the first, in the opinion of all competent judges ; and its productions are gradually encroaching upon the place in popular esteem hitherto monopolized by foreign importations.

The Bel Air exhibit at the Centennial Exposition was regarded by most people as the finest there shown ; and, although the general policy of the system of awards prevented the judges from making any distinction between the successful competitors, the terms of the report accompanying the medal awarded to the Bel Air Manufacturing Company sufficiently indicate their high opinion of its merits. Yet none of these goods were made specially for the Exposition, or were, in any respect, superior to the ordinary manufactures of the company : in fact, every sample was a duplicate (in most cases, cut from the same piece) of the samples by means of which its goods were actually sold during the seasons of 1875 and 1876.

Messrs. Hardt & Co., Nos. 473 and 475 Broome St., New York, are the sole selling agents of the company, and are authorized to receive orders for the manufacture of any desired patterns of all-wool cassimeres ; the company guaranteeing that all goods made in pursuance of such orders shall be fully equal to the samples furnished. The range of styles usually offered for sale is, however, sufficiently extensive to suit almost every taste ; and the four-leafed clover, the trade-mark of the Bel Air Mill, may be generally accepted as evidence of the desirability of the fabrics to which it is affixed.

MERRICK THREAD COMPANY, HOLYOKE, MASS.**A W A R D.****PRODUCT: Ready-Wound Bobbins of Cotton Thread.***Commended for the very ingenious device for saving labor in their "patent" ready-wound bobbins, for use in sewing-machines.***J U D G E S.**

EDWARD ATKINSON.*
 HUGH WADDELL, Jr.
 EDWARD RICHARDSON.
 A. D. LOCKWOOD.
 CHARLES H. WOLFF.
 SAMUEL WEBBER.
 GEORGE O. BAKER.
 ISAAC WATTS.

W. W. HULSE.
 DON ALVARO DE LA GANDARA.
 ARNOLD GOLDY.
 GUSTAV HERRMANN.
 JOSEPH DASSI.
 MENI RODRIGUES DE VASCON-
 CELLOS.

C L A I M.

In no branch of the cotton manufacture in this country has there been greater improvement in the last ten years than in spool cotton. The supply of this article, in all of the finer six-cord qualities, was almost entirely foreign ten years ago. Since that time the increase in the consumption of sewing-thread, caused largely by the almost universal use of the sewing-machine, has been such as to call the attention of those already engaged in this branch of cotton manufacture to the importance of greater perfection in the quality, and also of adapting the style of putting up to the various requirements of the sewing-machine. One of these requirements was a cotton for use in the sewing-machine shuttle. The mode of supplying this use was to fill the iron bobbin by winding upon it the thread from the ordinary wood spool as purchased at the "store." This operation as effected by any of the various devices and attachments for the purpose was slow, imperfect, and unsatisfactory, and was one of the most serious drawbacks to the use of the sewing-machine. The Merrick Thread Co., of Holyoke, Mass.,—employing about three hundred (300) hands in the manufacture of the best quality of Sea Island six and three cord spool cotton, put up in style to meet the requirements of the clothing, corset, and shoe manufacturing,—early directed their efforts to furnishing a wooden bobbin fitted to the shuttles of the various makes and styles of

* Signing Judge.

machines, and filled with thread ready for use. A series of experiments, covering several years, attended with repeated failure, finally resulted in the invention and perfection of the patent ready-wound wooden bobbins, for which the Centennial Committee at Philadelphia gave the company the highest award. The merit of the invention that entitled it to the award so justly bestowed, may be briefly stated as follows :—

The wooden bobbins are wound by machinery in very much the same way as an ordinary spool of thread, and just as perfectly : hence, when placed in the machine, they wind off evenly and uniformly, giving a perfect tension,—which is an indispensable requisite to a perfect sewing-machine stitch. The filling of the ordinary iron bobbin requires a great deal of time and labor, and is very tedious, while much of its capacity is lost from the fact that it cannot be easily and thoroughly filled by hand ; and the machine-wound bobbin contains nearly twice as much thread as the hand-wound, thus enabling the operator to produce a much greater amount of work in a given time. At the high speeds at which sewing-machines are run by steam-power in manufactories, the wear and tear upon the machine is very great ; and bobbins especially are soon worn out, having to be replaced from time to time. The iron bobbin, likewise, soon wears out the centre of the shuttle, rendering it useless ; and the operators of the sewing-machines, in winding their own bobbins, will oftentimes (through carelessness or inexperience) fill them too full, or run over the end, thereby wasting large quantities of thread. All these losses, and others that might be mentioned, which in the aggregate stand at the end of the year at no trifling sum, are overcome by the use of the patent bobbin.

This bobbin is patented in this country and in England. It meets with a ready sale wherever it is introduced ; and the trade is increasing every year. The manifest advantages of using such a convenience are very great ; and it is not surprising that it is being so generally adopted.

AMOSKEAG MANUFACTURING COMPANY, MAN- CHESTER, N. H.

A W A R D.

PRODUCT: Tickings, Denims, Domestics, Gingham, &c.

Ginghams, excellence in red, orange, and black combinations, heretofore almost confined to foreign goods; pink and mauve clear and well colored; green in all shades, and combination plaids, remarkably fine. Tickings, A C A, excellent. Awning stripes, blue and red striped, excellent. Denims, blue and brown, excellent. Cheviot shirtings, excellent fabric, peculiarly fine combination of colors.

A. GOLDY.

(Signature of the Judge.)

Approval of Group Judges.

SAMUEL WEBBER.
CHARLES H. WOLFF.
GEORGE O. BAKER.
HUGH WADDELL, Jr.
EDWARD ATKINSON.
JOSEPH DASSI.
GUSTAV HERRMANN.

MENI RODRIGUES DE VASCON-
CELLOS.
DON ALVARO DE LA GANDARA.
A. D. LOCKWOOD.
EDWARD RICHARDSON.
WM. W. HULSE.

The Amoskeag Manufacturing Company of Manchester, N. H., the corporation making the exhibit above referred to, were among the earliest to commence the manufacture of cotton goods in this country, and they have now one of the most extensive, complete, and well-known establishments in the United States.

The first cotton mill, at Amoskeag Falls, was erected in 1809, near the present location of the mills of this company. This was purchased in 1825 by individuals, who projected and afterwards organized the present corporation, which was incorporated in 1831 by the State of New Hampshire, with authority to use a capital of \$1,000,000,—since increased, from time to time, by other grants, until they have now invested in their *plant* a capital of \$3,000,000.

Among the earliest operations of this company, after its incorporation, was the purchase of about 2,500 acres of land, contiguous to Amoskeag Falls, and lying on both sides of the river, by the use of which they have been enabled to improve and utilize the immense

water-power—about 10,000 horse-power—furnished by the river at that point. Upon this land they have laid out a town, with public squares, sites for churches, school-houses, and such public buildings as are likely to be required; built their dams, canals, weirs, and such works as are necessary to the control and use of the water-power; built their mills, shops, boarding and dwelling houses for their employés, and, by the sale of lots to purchasers drawn there by a desire for employment or trade, they have laid the foundations of a city that now contains 30,000 inhabitants.

When the company was incorporated, in 1831, they had in operation, in three small wooden mills on the Amoskeag Falls, about one mile north of the mill sites they now occupy, about 12,000 spindles. The valuation of this property was \$200,000, and the goods produced at their mills had the best reputation of any of their kind then in the market. The small wooden mills then occupied have since, one after the other, been destroyed by fire, and replaced on new sites by mills larger and better, and filled with improved machinery. During this intervening period of nearly half a century, this company have built and put into operation for themselves mills containing 138,000 spindles and 4,500 looms, building in their own shops and foundry every thing required; and have meanwhile, during this long and busy period, and through all the extensions and changes of the works, continued and increased the production of the standard goods they manufacture, which have in quality and perfection remained almost without change, except such as may be due to improved processes and machinery. And this company, to-day, puts upon the market colored and white domestic goods, tickings, denims and stripes, sheeting and drilling, chevriot or fancy shirting, ginghams and fancy dress fabrics, in great variety of style and color,—goods which have stood the test of nearly fifty years' competition and experience in the market, and stand to-day confessedly at the head, and not excelled by any other goods of the same class wherever made.

Within the last six years, the mills of this corporation have been thoroughly renovated, and, in many cases, entirely rebuilt; and old or worn machinery, replaced by new, of improved patterns and construction. In these improvements, and the erection of new gingham and fancy-dress goods mills, the sum of \$2,000,000 has been expended; and every thing connected with the manufacture of cloth is, at this time, practically modern. The annual production of the company's mills is now about 12,000,000 of pounds, or 36,000,000 of yards, and their yearly consumption of cotton is more than 26,000 bales. This

large product is placed upon the market, properly finished, directly from the manufactories of the company.

The "Mill Yard," in which these manufactories are situated, contains about thirty-five acres; the mills, shops, and various buildings connected therewith, mostly built of brick, with incombustible roofs, cover an area of 350,000 square feet, equal to eight acres; their cubic contents are 14,500,000 cubic feet, and they have a floor surface of 1,170,000 square feet, or $26\frac{8}{10}$ acres; of which 950,000 square feet ($22\frac{1}{4}$ acres) is covered by machinery in operation.

The power for driving this machinery is furnished by fifteen turbine water-wheels, giving an aggregate of 3,450 horse-power, with a steam-engine capable of furnishing, if desired, a supplemental power equal to 1,000 horse-power, in case of a short supply of water.

Contiguous to their mill yard, this company occupy about forty acres of land, lying between their mills and the principal street of the city, upon which they have about 300 tenement-houses, mostly in blocks built of brick, with slated roofs. These houses are so situated as to be readily supplied with an abundance of water from the city aqueduct, and lighted with gas. They were built and are maintained solely for the occupancy of their employés at the mills and shops, to whom they are rented upon very moderate terms.

GLOBE WOOLLEN COMPANY, UTICA, N. Y.

A W A R D.

PRODUCT: Fancy Cassimeres.

An admirable exhibit of fancy cassimeres in great variety of design, superior in texture and finish; the silk-mixed hair-lines and velvet effects are specially noteworthy.

J U D G E S.

JOHN L. HAYES.
ELLIOT C. COWDIN.
CHARLES LE BOUTILLIER.
CHARLES J. ELLIS.*
J. D. LANG.
CONSUL GUSTAV GEBHARD.
THEODORE BOCHNER, Jr.
HENRY MITCHELL.

Dr. MAX WEIGERT.
LOUIS CHATEL.
CARL ARNBERG.
HAYAMI KENZO.
JOHN G. NEESER.
AUGUST BEHMER.
ALBERT DANINOS.

This corporation was organized August 1, 1855, by stockholders of the Globe Mills, which company had been so unfortunate as to not only lose their entire capital, but also to inflict an assessment of ninety-eight per centum upon each dollar owned by each stockholder. The Hon. T. S. Faxton, of Utica, a large owner in the old company, was the most prominent in the reorganization of the new; he was elected its first President, which office he still continues to hold. In 1857, Mr. Robert Middleton was elected as agent and general manager of the mill; he also is yet connected with the company in the same position.

Up to this time the new company had met with but indifferent success; but, after the effects of the panic of 1857 had passed, an era of prosperity began; and under the judicious management of these two gentlemen, aided by the advice of the Board of Trustees, it continued until 1871. During this time the mill was enlarged, new buildings built, the old machinery entirely replaced by new, the character of the goods improved, and the reputation of its manufactures was made second to none in this country.

On the 6th September, 1871, a fire occurred which resulted in the

* Signing Judge.

destruction of the mill and contents. Mr. Faxton, the largest owner, who then had advanced to that time in life when most men seek to lay aside the cares of business, was of the opinion that the interests of the city, and that of the large number of operatives who were employed, required that it should be rebuilt. In this he was unanimously seconded by his associates; and, before the debris had cooled, gangs of men were employed in preparing for new buildings. While building was progressing, Mr. Middleton visited the large woollen mills in Europe, and ascertained what is considered the best machines for each department. Early in 1873, the mills were completed: one of which is 234 feet by 50, the second 150 by 50; containing 20 sets Platt's English cards (equal to 23 sets as usually rated), 30 self-acting mules, 85 broad and 18 narrow looms, with other machinery of the best make procurable, whether of home or foreign invention.

The salesroom (79 and 81 Worth Street, New York) was opened in July, 1873, under the management of Mr. Wm. W. Coffin, who had become connected with the company in 1856, and since 1865 has had charge of the New York business; and, although compelled by the fire to close the salesroom for nearly two years, he says that old customers by their purchases from then until now show how gladly they welcomed the return of the Globe ticket to the market.

The merits of the fancy cassimeres made by this company can best be told by the jobber and consumer. What this is may be judged from the fact, that, during the business depression which has lasted so long, the mill has been run full time, without loss of an hour of work to any operative, except by their own wish.

The report of the judges of the International Exhibition is referred to by the management with much pride, from the fact that not a yard of goods was displayed but such as had been made for the market, — *not a yard specially for the Exhibition.*

NAUMKEAG STEAM COTTON CO., SALEM, MASS.

The United States Centennial Commission has examined the report of the judges, and accepted the following reasons, and decreed an award in conformity therewith.

PHILADELPHIA, Dec. 20, 1876.

REPORT ON AWARDS.

PRODUCT: Cotton Fabrics.

Name and Address of Exhibitor :

NAUMKEAG STEAM COTTON COMPANY,
SALEM, MASS.

The undersigned, having examined the product herein described, respectfully recommends the same to the United States Centennial Commission for award, for the following reasons, viz. :—

For the excellent and uniform quality of their plain and twilled wide sheeting, $\frac{1}{2}$ and $\frac{1}{4}$ wide.

ISAAC WATTS.

(Signature of the Judge.)

Approval of Group Judges.

EDWARD ATKINSON.
SAMUEL WEBBER.
GEORGE B. BAKER.
JOSEPH DASSI.
A. GOLDY.
A. D. LOCKWOOD.
E. RICHARDSON.

WM. W. HULSE.
CHARLES H. WOLFF.
GUSTAV HERRMANN.
H. WADDELL, Jr.
MENI RODRIGUES DE VASCOM-
CLOS.
A. DE LA GANDARA.

A true copy of the record :

FRANCIS A. WALKER,
Chief of the Bureau of Awards.

Given by authority of the United States Centennial Commission.

A. T. GOSHORN, *Director-General.*
J. R. HAWLEY, *President.*

J. L. CAMPBELL, *Secretary.*

The NAUMKEAG STEAM COTTON COMPANY, of Salem, Mass., manufacture, —

Naumkeag heavy satteen twills, bleached and dyed.

Pequot fine heavy sheeting, $\frac{3}{4}$ to $1\frac{1}{4}$ wide, bleached and unbleached.

Naumkeag heavy twilled sheeting, $\frac{3}{4}$ to $1\frac{1}{4}$ wide, bleached and unbleached.

El Dorado family cotton, 36 inches and 40 inches wide, bleached and unbleached.

The NAUMKEAG STEAM COTTON COMPANY was incorporated by the Legislature of Massachusetts, April 5, 1839, with a capital stock of \$200,000.

The first mill erected by the company was completed in 1847, the capital stock having been meanwhile increased to \$700,000. It was then the largest and best appointed mill in the United States.

The building was 400 feet long by 60 feet wide, contained 32,768 mule spindles and 643 looms; and its weekly production was 94,000 yards of cloth, weighing 22,000 pounds, made from No. 30 yarn, 72 picks to the inch.

The mill was successful from the start; and, after twelve years of uninterrupted prosperity, the capital stock was increased to \$1,200,000 (in 1861), and a second mill, 428 feet long by 64 feet wide, containing 35,000 spindles and 700 looms, was built and successfully operated in connection with mill No. 1.

In 1865, the capital stock was further increased to \$1,500,000, and No. 3 Mill was built. This building is 189 feet long, 95 feet wide, and contains 15,000 spindles and 350 looms.

The company is now running the three mills, containing 90,000 spindles and 1,900 looms, driven by two pairs of Corliiss steam-engines of 2,000 horse-power in the aggregate, employing nearly 1,400 operatives, and consuming 11,000 bales of cotton per annum in the production of 14,000,000 yards of cloth.

Mr. JOHN KILBURN is the Manufacturing Agent; Messrs. J. L. BREMER, BROTHER, & Co., of Boston and New York, are the Selling Agents; and Mr. HENRY D. SULLIVAN is Treasurer of the Company.

JESSE EDDY'S SONS, FALL RIVER, MASS.

A W A R D.

PRODUCT: Fancy Cassimeres.

Well-made fancy cassimeres of novel English effects, in great variety, and at moderate prices.

J U D G E S.

JOHN L. HAYES.
ELLIOT C. COWDIN.
CHARLES LE BOUTILLIER.
CHARLES J. ELLIS.*
J. D. LANG.
CONSUL GUSTAV GEBHARD.
THEODORE BOCHNER, Jr.
HENRY MITCHELL.

Dr. MAX WEIGERT.
LOUIS CHATEL.
CARL ARNBERG.
HAYAMI KENZO.
JOHN G. NEESER.
AUGUST BEHMER.
ALBERT DANINOS.

The manufacture of woollen cloth, in a fabric known as satinets, made with a cotton warp and wool filling, was commenced in the city of Fall River in the year 1825. It was in a stone building owned by the Pocasset Company, and located within the present site of the Pocasset Mill. The business was carried on by Samuel Shove, John and Jesse Eddy, under the firm name of Samuel Shove & Co. In the year 1834, the firm was dissolved by the withdrawal of Samuel Shove; when the business was continued by John and Jesse Eddy, under the firm name of J. & J. Eddy. The manufacture of these goods was largely increased from year to year, and were well known in all the principal markets as the best of satinets. In the years 1843 and 1844, the manufacture of these goods was abandoned, and a fabric called "cassimere" was commenced, which was made of all-wool. They were made in various shades of mixtures, and in stripe and plaid effects, and almost entirely superseded the use of satinets for the best trade.

In the year 1845, in consequence of the mill being taken down to give place to a larger one for the manufacture of cotton, the business was removed to a place known as Eagle Mill, situated about three and a half miles south of Fall River, in the town of Tiverton, R. I. Shortly

* Signing Judge.

after this, the firm of J. & J. Eddy was dissolved; but the business was still continued in this place for a few years, when the property was destroyed by fire. In the mean time, Jesse Eddy, in connection with Joseph Durfee, bought and located a mill on a tract of land known as Mosquito Island, near to the outlet of the pond, to manufacture the same kind of goods as had been made by J. & J. Eddy. As operations were about ready to be commenced, Joseph Durfee died; and it was not until January, 1849, that manufacturing was begun.

Jesse Eddy became the proprietor, and, shortly after, took his son into company with him. The business was now conducted for about twenty-one years under the firm name of Jesse Eddy & Son. In the year 1873, Jesse Eddy died, and the business passed into the hands of his two sons, who still continue it under the firm name of Jesse Eddy's Sons.

No injustice is done to any of the parties who have been identified with this enterprise, when we say the spirit of Jesse Eddy was the controlling power from first to last. He was born in Northbridge in 1801, was of Quaker descent, and commenced his business career as a practical weaver in Woonsocket, in 1824.

It was his ambition to excel in every thing. He made goods for the best trade, using the highest grades of wools; finding his customers in the merchant tailors of our principal cities, or manufacturing solely on orders from jobbers. At first, he copied largely from the foreign styles then in vogue: but, gaining by experience and a carefully cultivated taste, he created his own designs; and, for many years before his decease, was able to anticipate the wants of the best class of consumers.

The fact that this establishment has been conducted by private enterprise has added not a little to its efficiency. It is one of the oldest in the country; of those, also, whose proprietorship has always remained in the same family; and we feel there is no immodesty in claiming that there are few which can boast of maintaining for so many years the high reputation of their goods, for good fabric, tasteful design, and absolute freedom from shoddy and flocks in the material.

B. B. TILT AND SON, PATERSON, N. J.**A W A R D.****PRODUCT: Figured Silks and Silk Looms.**

Commended for brocade silks and handkerchiefs of superior quality and workmanship, excellent in color and style; also, for a Jacquard ribbon-weaving loom and figure-silk loom, both of very good construction.

J U D G E S.

JOHN L. HAYES.
ELLIOT C. COWDIN.
CHARLES LE BOUTILLIER.*
CHARLES J. ELLIS.
J. D. LANG.
CONSUL GUSTAV GEBHARD.
THEODORE BOCHNER.
HENRY MITCHELL.

DR. MAX WEIGERT.
LOUIS CHATEL.
CARL ARNBERG.
HAYAMI KENZO.
JOHN G. NEESER.
AUGUST BEHMER.
ALBERT DANINOS.

C L A I M.

Upon entering our exhibits for the late Centennial Exhibition, at Philadelphia, we claimed for our goods superiority of design and general excellence of workmanship; for our looms, which we built upon our own premises, their superior construction, rapidity of motion, and their particular adaptability to silk weaving. We have been most fully sustained in all that we asserted, by the decision of the Judges of Awards. But we feel that some more explicit description of our manufactures is required; and will endeavor, in a few brief remarks, to describe the peculiar advantages we possess in conducting a plain and fancy trade in silk manufactures. The castings of our looms, and the total building of them, is done at our own works: they are made expressly with a view to the various classes of goods they are intended to produce, and are acknowledged, by most competent judges, to be the best looms, and the most suitable for the manufacture of silk fabrics. Our raw silk is selected from the choicest filatures, and carefully sorted for the different purposes for which it is to be used. We claim especially for ourselves supremacy in figured goods: with us this branch is a decided specialty, and our efforts have ever been to rival the beautiful productions of Europe by original designs suitable to the American market; and from the expressions of astonishment

* Signing Judge.

at our success coming from European manufacturers of celebrity who visited the Exposition, and many of whom have also visited our works, we have every reason to feel gratified at the results we have obtained. One large manufacturer from Germany expressed the greatest surprise when assured that we copied no designs from Europe or elsewhere, except we had special orders for such work. . Our patterns have become, through the large quantities we sold at the Centennial Exhibition, more widely and extensively known than ever before. Many purchasers, upon their return home, regretting they had not bought more largely, sent us their orders for still more; and friends to whom they showed their purchases procured from them the address of our firm, and, from simply seeing what others had bought, forwarded their orders for the particular patterns they desired. This was especially the case with handkerchiefs, scarfs, ties, and book-marks. The "eagle" handkerchief, also the "dove" pattern, were written for from every part of the country. Our silk-woven portraits of Washington, Lincoln, and others, were admired by all. Hundreds of visitors to the Exhibition applied at our space for a duplicate of some particular article they had seen in possession of some friend or acquaintance, a recent visitor to Philadelphia. Our trade was positively immense. The appreciation of the American public for silk goods of home manufacture was strongly evinced by the enormous demand; our sales being only limited by the quantities we were able to produce. We stood almost alone in giving to the public an opportunity of buying silk goods purely home-made, and at the same time giving them a full insight into our operation of weaving the various articles; but having full confidence in the excellence of our workmanship, as well as the chasteness and originality of our designs, we had no fear of foreign competition; and have every reason to feel proud that our estimate of the American people was correct,—that they *can* and *do* appreciate elegance of design, choice colors, and good workmanship, and that they are not so uninformed as to silk goods as many supposed.

Our business comprises plain and figured silks of every description: handkerchiefs, mufflers, scarfs, ties, gauzes, dress goods, &c., in every variety of design, color, and quality. Book-marks, badges woven in silk for masonic or any organization or society. Our silk-woven portraits are remarkable for their striking likenesses of persons portrayed. We are rapidly accumulating a variety of subjects for our book-marks, and are in a position to supply the trade with almost any subject, and in any quantities. We have, we firmly believe, far greater facilities for the prosecution of this business of figured silks than any other house in the trade; and the pre-eminence we have attained we shall endeavor strictly to maintain.

LOWELL MANUFACTURING CO., LOWELL, MASS.

A W A R D.

PRODUCT: Carpets and Lastings.

An imposing exhibit of Brussels, Wilton, and two and three ply ingrain, all of the best fabrication; the designs original and tasteful, and the colors clear and bright; the material and texture indicating excellent wearing qualities. The exhibit is illustrative of a vast production. Commended also for lastings.

J U D G E S.

JOHN L. HAYES.
ELLIOT C. COWDIN.
CHARLES LE BOUTILLIER.
CHARLES J. ELLIS.
J. D. LANG.
Consul GUSTAV GEBHARD.
THEODORE BOCHNER, Jr.
HENRY MITCHELL.

Dr. MAX WEIGERT.*
LOUIS CHATEL.
CARL ARNBERG.
HAYAMI KENZO.
JOHN G. NEESER.
AUGUST BEHMER.
ALBERT DANINOS.

The exhibit of Wilton, Brussels, and ingrain carpeting by the Lowell Manufacturing Company was simply placing before visitors to the Centennial Exhibition such goods as fairly represent the quality of the usual products of this company.

Use of the best quality of stock, and a high degree of perfection in manufacture, combined with superior skill in designs and colorings, has secured universal acknowledgment that in no respect are the merits of these goods surpassed by the products of any establishment in the world.

Since 1828, this company has maintained a leading position in the manufacture of ingrain carpeting. Its business was commenced with a capital of \$300,000; to which additions were made, as extension of business required, until it reached the sum of \$2,000,000. Originally, there were but eleven shareholders; now, about seven hundred.

At first, and for many years, all carpeting was woven on hand-loom; and their use was continued by this company until about 1843. In the mean time, expensive efforts were made in England and elsewhere

* Signing Judge.

to produce a power-loom: but all efforts in that direction failed of success, until Mr. E. B. Bigelow invented the loom now so generally known as having caused a revolution in the processes of manufacture; producing a fabric superior in texture to any before known, and at the same time so materially reducing cost as to benefit the public in a marked degree.

The early history of the company was characterized by continuous and expensive efforts to improve machinery and perfect its manufactures. Able men were in the management of its affairs; and, comprehending the importance of substituting power-loom for the crude machines then in use, they made an agreement with Mr. Bigelow, obligating the company to furnish means for perfecting his inventions, when other parties to whom he applied for aid were without confidence in his ability to succeed better in his undertaking than others had previously done, and were unwilling to risk the necessarily great expenditure involved in the attempt, which by them was regarded as visionary.

The efforts of Mr. Bigelow, aided as they were by the enterprise of this company, were eminently successful; and the use of his inventions, with other machinery of the most perfect construction, gives to this company facilities for the manufacture of ingrain carpeting that are unsurpassed.

Equally good are their facilities for the manufacture of Wilton and Brussels carpetings, — a branch of business undertaken by the company but a few years since, the success of which is shown by the high order of merit appearing in the goods.

In the manufacture of shoe lastings and serges in the United States, this company was a pioneer; and now produces goods of this class that are second to none made elsewhere.

LANCASTER MILLS, CLINTON, MASS.

A W A R D.

PRODUCT: Fancy Gingham.

Commended for superior excellence in quality, good and fancy colors, thoroughly harmonized; great variety of very superior patterns.

J U D G E S.

EDWARD ATKINSON.
HUGH WADDELL, JR.
EDWARD RICHARDSON.
A. D. LOCKWOOD.
CHARLES H. WOLFF.
SAMUEL WEBBER.
GEORGE O. BAKER.
ISAAC WATTS.

W. W. HULSE.
DON ALVARO DE LA GANDARA.
ARNOLD GOLDY.*
GUSTAV HERRMANN.
JOSEPH DASSI.
MENI RODRIGUES DE VASCOM-
CELLOS.

The Lancaster Mills were organized in 1844, with the following officers:—

President.

STEPHEN FAIRBANKS.

Clerk and Treasurer.

WILLIAM C. APPLETON.

Agent or Superintendent.

HORATIO R. BIGELOW.

Directors.

STEPHEN FAIRBANKS.
WILLIAM C. APPLETON.
E. B. BIGELOW.

ROBERT APPLETON.
H. R. KENDALL.
HENRY TIMMINS.

The class of fabrics known as gingham were introduced into Great Britain near the close of the last century from India, with the name they now bear then attached to them, and where they had been in general consumption from an unknown date.

Cortez, in his conquest of Mexico, also found a similar class of cotton fabrics in use among the natives of that country, — with this singular feature, however, that the checks and stripes were woven in on one side, with a reversible side of plain colors. Samples of these cloths were sent by the conqueror back to Barcelona.

It will be matter of surprise to many, how much more numerous and intricate the processes of manufacture in gingham are than those of plain cloths, — the latter requiring six, the former sixteen; the yarns in all cases being dyed before weaving.

Though the most costly of cotton cloths, as may be seen by the

* Signing Judge.

statement following, gingham have never lost their hold upon the popular taste, and are in growing demand. Plain cotton cloths cost 11 to 12 cents the pound; calico, printed, 14 to 15 cents a pound; muslins de laine, 16 to 17 cents a pound; gingham, 19 to 20 cents the pound. It may be truthfully said of the ginghams made at the Lancaster Mills, that while the standard of excellence in fabric, in all particulars, has not been lessened, in the competition with those of foreign make, but is fully up in grade to those of any other manufacture, the first cost has been reduced, so that the margin of expense is much less between this and other classes of cotton goods than formerly. This is due specially to two causes: one, the better raw material entering into the manufacture, making a great saving in economy of wear and tear; the other, the advantages given by machinery furnished by the inventive genius of Erastus B. Bigelow, the founder of the industry under consideration, at Clinton, Mass. It is nearly half a century since the attention of Mr. Bigelow was turned in the direction of improvements in looms; and in that time his inventions have effected an entire revolution in many most important departments of that application of machinery, embracing suspender webbing, counterpanes, wire-cloth, ginghams, carpets, &c. In one of these industries, — that of gingham manufacture, which we have been considering, in the Lancaster Mills, — its importance may be seen in the fact, the mill has five and a half acres of flooring, distributed as follows: cotton store-house, 7,500 square feet; picking-house, 8,000; carding department, 36,000; spinning department, 40,000; reeling, 5,000; dyeing and drying rooms, 12,000; winding, 6,500; quilling, 6,500; warping and dressing, 13,000; weaving, a single room covering two acres, 87,120; yarn store-room, 4,800; finishing-room, including shearing, calendering, starching, tentering, measuring, pressing, folding, and packing, 8,000; total number of looms, 1,515. The character of the product of this mill is given in the award above. The goods cannot be surpassed by those of any other establishment, here or abroad.

We may say, in closing, that the locality and social surroundings of this industry are of the most inviting character, and the annual dividends for more than twenty-five years have proved satisfactory to those who have invested in the enterprise.

OFFICERS.

President.

SAMUEL G. SNELLING.

Clerk.

SAMUEL V. GOODHUM.

Treasurer.

JAMES S. AMORY.

Selling Agents.

UPHAM, TUCKER, & Co., Boston.

LEWISTON MILLS, LEWISTON, MAINE.

The United States Centennial Commission has examined the report of the judges, and accepted the following reasons, and decreed an award in conformity therewith.

REPORT ON AWARDS.

PRODUCT: Colored Duck, Cottonades, Tickings, Cheviots.

Name and Address of Exhibitor:

LEWISTON MILLS, LEWISTON, MAINE.

The undersigned, having examined the product herein described, respectfully recommends the same to the United States Centennial Commission for award, for the following reasons, viz.:—

The colored ducks are excellent in styles and fabrics, the cotton cassimeres very flexible, and durable. Four-quarter tickings, heavy, smooth, and of the best material. Cheviots peculiar in delicate shadings and well made.

CHARLES H. WOLFF.

(Signature of the Judge.)

Approval of Group Judges.

EDWARD ATKINSON.

SAMUEL WEBBER.

GEORGE O. BAKER.

JOSEPH DASSI.

ARNOLD GOLDY.

A. D. LOCKWOOD.

EDWARD RICHARDSON.

WM. W. HULSE.

GUSTAV HERRMANN.

HUGH WADDELL, JR.

MENI RODRIGUES DE VASCONCELLOS.

DON ALVARO DE LA GANDARA.

A true copy of the record:

FRANCIS A. WALKER,
Chief of the Bureau of Awards.

Given by authority of the United States Centennial Commission.

A. T. GOSHORN, *Director-General.*

J. R. HAWLEY, *President.*

J. L. CAMPBELL, *Secretary.*

This company was organized and started in 1851 and 1852, for the manufacture of seamless bags, and other coarse goods of a similar character, and was eminently successful in making these coarse fabrics.

In 1861 and 1862, the company decided to reorganize and to increase the capital, to erect large buildings, and add machinery adapted to the manufacture of colored goods, in a variety of styles, quality, and fineness of yarn. A large mill lot was purchased, water-power secured, large buildings of the most substantial character erected, especial care being taken to construct the "hydraulic" department in the most improved, substantial, and durable manner; so that the power is ample, and permanently secured against all acknowledged contingencies.

The best and most improved machinery was purchased, and additions have been made from time to time; and the policy of the company has been to keep the same in the best working order, and up to the highest standard of known improvement.

The company have now invested, we believe, in buildings, machinery, land, and water-power, upwards of a million of dollars; and have, without doubt, one of the best arranged and appointed establishments in the country, for the manufacture of plain and colored coarse goods. They make a variety of tickings, stripes, cheviots, denims, checks, cottonades, plain, colored, and fancy ducks, osnaburgs, and seamless bags. These goods are, generally, in quality and style, especially adapted to the wants of the country people, the farmer, and the mechanic, — the large consumers of such goods; and among that class, both in this country and the Canadian Provinces, they are and have been for a long time standard goods, and universally in demand. These goods are sold by Messrs. George C. Richardson & Co., Boston and New York, one of the largest commission houses in the country.

At the Centennial Exhibition, these goods, especially the cottonades, tickings, cheviots, and ducks, were commended as being among the best goods of the kind on exhibition.

JAMES SHORT, NEW BRUNSWICK, N. J.**A W A R D.****PRODUCT: Carpet-Loom.***A tapestry carpet-loom with an ingenious positive motion.***J U D G E S.****JOHN L. HAYES.****ELLIOT C. COWDIN.****CHARLES LE BOUTILLIER.****CHARLES J. ELLIS.****J. D. LANG.****CONSUL GUSTAV GEBHARD.****THEODORE BOCHNER, Jr.****HENRY MITCHELL.****Dr. MAX WEIGERT.*****LOUIS CHATEL.****CARL ARNBERG.****HAYAMI KENZO.****JOHN G. NEESER.****AUGUST BEHMER.****ALBERT DANINOS.**

C L A I M.**DESCRIPTION.***Inventor and Exhibitor.***JAMES SHORT, Superintendent New Brunswick Carpet Mills,
New Brunswick, N. J.**

A loom for weaving tapestry Brussels carpeting; but the principle is adaptable to all kinds of looms or sewing-machines, or to any machine where differential-duplex motion is required.

This loom is built on the decimal principle, the motor being a gear-wheel with a slot cast across its diameter; this wheel is mounted on the end of a shaft and set in bearings to a driving pulley, like the chuck of a lathe, the shaft not passing the bottom of the set. In this slotted wheel are set two cranks at either side of the centre of the slotted wheel, one crank being near the centre and the other at the circumference of the slot at the opposite side of the centre to the other crank. These cranks are mounted on two shafts, which are in the same centre;

* Signing Judge.

one shaft being a tube, and the other solid, and fitted to run in the outer shaft or tube, the inner shaft passing inward to the loom beyond the outer shaft or tube, so that a gear may be applied to it to give motion to other shafts. The cranks are made the same length outward from the centre of the inner shaft, and the crank-pins are set in a square box to fit the slot in the wheel. It will now be seen that, when ordinary rotary motion is given to the slotted wheel, the cranks will be moved alternately, and respectively in their own half of the slot, from centre to circumference; because the centre of the slotted wheel shaft is set eccentric to the centre of the inner-crank shaft, exactly or nearly so, the length of the cranks. Therefore, when the slotted wheel moves half a revolution, the crank at the circumference is moved in to near the centre, and immediately the crank at the centre is moved to the circumference; and so on, alternately. Wherefore the motions of the crank shafts are perfectly positive to each other. And as each crank turns a revolution, there is a *crank* motion; and as they move fast and slow, there is a *cam* motion; and as they are in motion all the time, there is an eccentric motion. So that whatever kind of goods, narrow or wide, — two inches or thirty yards, — the shuttle motion will not operate till the harness and lay motion has operated. As the cranks do not pass the centre of the slotted-wheel shaft, all dead centres are overcome in the machine. And all that is required to get a multiplicity of motions in a machine, and have the proper time, is to gear on the decimal principle; and you get movements and dwells without cams.

The motion is adaptable to *all kinds* of looms, wide and narrow; also, for sewing-machines, or any machine where cranks, cams, and eccentrics have been used, as this motion is the concentration of the crank, cam, and eccentric in one wheel.

Patent-rights for sale.

Respectfully,

J. P. SHORT.

H. W. JOHNS, NEW YORK CITY.

A W A R D.

PRODUCT: Asbestos Materials.

Variety of fibre, — domestic and foreign. Roofing excellent, durable, economical; especially resisting outside heat and fire. Asbestos covering on wood put on in the liquid state, and solidified by the action of the air. Greatest success in fire-proof outer and inner coating, covering felt and rough-hair fabrics.

J U D G E S.

EDWARD ATKINSON.
HUGH WADDELL, JR.
EDWARD RICHARDSON.
A. D. LOCKWOOD.
CHARLES H. WOLFF.*
SAMUEL WEBBER.
GEORGE O. BAKER.
ISAAC WATTS.

W. W. HULSE.
DON ALVARO DE LA GANDARA.
ARNOLD GOLDBY.
GUSTAV HERRMANN.
JOSEPH DASSI.
MENI RODRIGUES DE VASCONCELLOS.

Asbestos Roofing (patented). — This is an entirely different material from any other ever produced. It consists of a foundation of strong canvas, to which is attached, by a water-proof composition, a layer of asbestos-coated felt on one side, and a manilla lining on the other; forming a sheet resembling leather, which, after being fastened to the roof, requires the asbestos coating to complete and preserve it. This material excels all portable or composition roofings in strength, — being ten times stronger than any felt or other roofing foundation. It is composed of a better class of materials than any other, and is practically fire-proof. It weighs only about 60 lbs. to 100 square feet; thus saving a large percentage of the cost of transportation and cost of heavy timbers required for other composition roofs. It is prepared ready for use, and can be readily applied by unskilled workmen; and, when finished, presents a white surface, rendering it the coolest form of roof in summer. Its cost is only about one half as much as tin; and, when properly cared for, has proven fully as durable.

Asbestos Steam-pipes and Boiler Coverings (consisting of a cement felting, to be applied like a mortar). — A lining felt, used as an insulator under the same, and also under hair felts, preventing injury from heat. The cement felting, being composed partly of asbestos fibre,

* Signing Judge.

will not disintegrate like other cements which are held together by hair or vegetable fibre. It is much lighter (more porous) than any other; and by actual tests, made at great expense by the United States government, was found to excel *all others* in non-radiating qualities. It is not liable to crack by expansion of pipes; and, a less quantity being required, costs less for application; and pipes are much smaller and neater. Combined with the insulating asbestos-lining felt, still more valuable results are attained. Double and triple air-chambers, formed by alternate layers of asbestos-lining felt and hair, and enveloped with our fire-proof, non-porous sheathing, give the best results for a given thickness of any other form of covering known, and at a less cost. These are ready for use, and can be easily applied by any one.

Asbestos Paints (all shades). — These paints differ from all others in containing a body which strengthens the linseed-oil, in addition to the indestructible character of the mineral body; and they contain no water nor chemical agents, as is the case with nearly all other liquid paints in use. The advantages are: one coat forms a protective covering nearly equal to two of any other; and they are second to none in durability, richness, and permanency of color; and being prepared ready for use are adapted especially for use of manufacturers, who can save fully one-third of the ordinary expense of painting by using these *undiluted* paints. Special paints are made for tin roofs, gas-holders, &c. Fire-proof paints, in light tints, — costing only one-third as much as ordinary oil-paints, — for the protection of shingle roofs, barns, out-houses, fences, bridges, boiler-rooms, factories, and other wooden structures liable to ignite from sparks, cinders, and flames.

Asbestos Cements (fire, acid, and water proof). — For cementing joints in wood, stone, and metals. For repairing leaks on roofs, acid and gas retorts, and pipes. Until asbestos was utilized in such cements, none had been found which answered these purposes for any length of time.

By use of asbestos we have also added greatly to the value of sheathings for wooden buildings, and for use under slate and shingle roofs; linings, boards, &c., for fire-proof partitions; steam packing, an indestructible, self-lubricator, &c.; all of which are of superior quality, prepared ready for use, and are made with the express intention of insuring their future use as standard articles.

All these articles are patented; and we would caution the public against infringements and worthless imitations.

D. GOFF & SON, PAWTUCKET, R. I.

A W A R D.

PRODUCT: Alpaca Braids.

A complete assortment of Alpaca braids, in a beautiful variety of colors and mixtures, of uniform width and length, and admirably adapted for trimming ladies' dresses.

HENRY MITCHELL, Signing Judge.

The goods made by D. Goff & Son are commonly called skirt braids; that is a worsted braid, about half an inch wide, in a great variety of shades, and used exclusively for binding (so as to protect) the lower edge of ladies' dresses. A "piece of braid" is about 4½ yards long. This is amply sufficient to go around any dress at the present day; though, in the days of "hoop-skirts," six-yard pieces were required. If a person outside of the trade were to give his attention to so simple a thing as a "piece of skirt braid," he would naturally conclude that the business of *making* it is of no great importance. Let us look at the facts and see. Estimating our population in women and girls to be 10,000,000 (another writer in this work estimates 15,000,000), and supposing that each woman and girl uses four pieces of braid a year, we have an annual consumption of 40,000,000 pieces of braid, or in weight equal to 1,000,000 pounds. If the rule holds true, that "two pounds of wool must be bought to make one pound of yarn" (or braid), the *importance* of the business will be conceded.

A *brief* statement of our relation to this industry will be all that space permits. Beginning as we did at the very commencement of the business in this country (1861, previous to which all braids were imported), we have seen its "ups and downs;" and it was mostly *down*, till the tariff of 1867 gave the long-desired aid to the *worst*ed business. Since 1867, the business has prospered, and stimulated home competition to such a degree that the consumer pays less money to-day for a piece of braid than before the war, and obtains a much better quality.

As we are the *oldest* concern of the kind in the country, we are also the *largest*. While other makes have acquired a local name, the reputation of "Goff's Braid" is national, bounded only by the limits of the country. Our new mill, built in 1872, is the most complete worsted yarn and braid mill in the world. We have no hesitation in making this statement, and challenge contradiction. The mill is built of brick, is 200 feet long, 55 feet wide, and 5 stories high. The motive power is a turbine wheel under 16 feet fall of water, giving 275 horse-power. Every process, from the raw wool to the completed braid, is carried on in this mill. The machinery (mostly imported) and entire outfit of

the mill is of the newest and most improved construction. The wool used is the "long combing," from the Cotswold and Leicestershire breed of sheep, obtained in Canada and in some of our States.

Our consumption of wool has been between 300,000 and 400,000 pounds per year. Our product of braid has been 100,000 yards per day (sufficient to bind over 20,000 dresses every day). We say *has been* in the above statements; for the reason that since Feb. 1 our production is greatly in excess of those figures, and promises to so continue. Previous to Feb. 1, 1877, skirt braid had always been put up in what is called "stick" form; a short piece of the braid being wound around it (called "cross-winding") to keep it in shape. It has always been a continual source of trouble and vexation to store-keepers to keep their stock of braid in good shape. Since the date above referred to, we have put our braid into the market in an entirely new form. It is wound on a wooden core, and the end secured by a wire loop clasping the braid, and piercing a hole in the centre of the spool. A yard more or less can be quickly pulled off to match patterns, and as quickly rolled on again; leaving the braid in its original condition. Cabinets of two drawers, to hold an assortment of colors, are furnished free to the retail trade. This new departure seems destined to revolutionize the braid business, on account of its convenience and great simplicity. It is as highly appreciated as ball-knitting cotton is over the old-fashioned skein. Retailers everywhere will have nothing but the "roll" braid; and, as a natural result, the jobbers are sending in large orders. We sold and delivered last month (March) nearly 100,000 dozen (over one million rolls, — value \$60,000). We are yet behind our orders, though our packing-room is turning out 5,000 dozen (60,000 rolls) of braid per day. These facts testify better than words to the merit of our last improvement. The success of the enterprise is assured. We are now running our mill over-time; and, if the increased demand continues, it will necessitate a large increase of machinery.

Our goods are sold from the mill direct to the jobbing trade all over the country. We pay freights to all points, and sell on thirty days' time only. We sell only by the case (144 dozen); and on our bill-heads, the quantity ("144 doz."), price ("70 cts."), and discount ("10 %") are all printed in, and the amounts carried out: so that all that is required in making out bills is to fill in the date and name of buyer. We make no deviation from our "printed bills" for any house in the country, and we sell to all of the largest. These are facts that testify to the *reputation* of "Goff's Braid."

The fact that we can fix such a price for *all* buyers, we have been told, is without a precedent in *any* business; and justifies us in saying, with all who use our goods, that —

"Goff's Braid is the best made."

CLARK THREAD CO., NEWARK, N. J.

A W A R D.

PRODUCT: Self-Acting Multi-Spool-Winding Machine for Sewing Threads and Spool Cotton.

Commended for originality and excellence of invention, fitness for the purpose intended, good construction, and accurate working of machine; resulting in a superior quality of thread and great economy of winding.

J U D G E S.

EDWARD ATKINSON.
HUGH WADDELL.
ED. RICHARDSON.
A. D. LOCKWOOD.
CHAS. H. WOLFF.
SAMUEL WEBBER.
GEORGE O. BAKER.

ISAAC WATTS.
W. W. HULSE.*
DON ALVARO DE LA GANDARA
A. GOLDY.
GUSTAV HERRMANN.
JOSEPH DASSI.
MENI RODRIGUES DE VASCON-
CELLOS.

Until within a few years, the great difficulty to be overcome in the introduction of sewing-machines was the objections made by manufacturers and operators to the threads then in use. These complaints were so well founded that the sales of the sewing-machines were greatly lessened on account of the impossibility of obtaining a thread adapted to their use.

Mr. George A. Clark, comprehending the difficulty, introduced into the American market the now famous six-cord Clark's "O. N. T." spool cotton, which met the demand, obviated the objections, and at once established a national reputation as the best thread in use for sewing-machines, and consequently for hand-sewing. To Mr. Clark, therefore, belongs the credit of being the first to supply those fine

* Signing Judge.

qualities of six-cord spool cotton with which his name is associated. The thread is used and recommended by agents of the Singer, Wheeler & Wilson, Grover & Baker, Domestic, Weed, Remington, Secor, and other sewing-machine companies.

The superior qualities of Clark's thread soon secured for it a large market; but, with the great popularity of the goods, came also counterfeits, which made it necessary for the manufacturers to adopt a trade-mark for their own and the public's protection; and now upon every genuine spool of their thread is the following:—



and on the reverse end, "George A. Clark, Sole Agent."

This trade-mark, meaning "our new thread," is familiar to every merchant in the United States; and all who have ever tried the genuine Clark's "O. N. T." spool cotton continue to use it.

The factory of the Clark Thread Company is located at Newark, New Jersey; embracing several acres of buildings and grounds, and employing fifteen hundred hands. The moving power is two Corliss engines of 1,000 horse-power, collectively. Associated with these central engines are others, in various parts of the establishment, making a total of nearly 1,400 horse-power employed at the factory, or equaling the motive force in Machinery Hall at the late International Exposition, Philadelphia. The raw material employed is "Sea Island Cotton," of which four grades are used. Connected with the factory are the "Clark Hose Company," of twenty members, with a perfect equipment of hose-carriages, reels, hand-pumps, &c. The company are drilled in practice every two weeks. "The Clark Thread Company Relief Society," and the "Eureka Boat Club and Thistle Band," are also organizations composed of the mill operatives, for benevolent and

recreative purposes. They are very efficient in their operations; the boat club making a world-wide reputation in its record at the Centennial International Regatta. Employers and operatives are heartily in sympathy with each other; and the result is a product from the mills that, in its beauty and perfection, is the just pride of all interested in its manufacture.

The five-story marble building, 400 Broadway, corner Walker Street, New York, wholly occupied as the salesrooms of George A. Clark & Brother, sole agents for the Clark Thread Company, is none too extensive for the business, and where there is every convenience for showing goods, and filling the orders coming from all points, with promptness and satisfaction to their customers.

George A. Clark & Brother are also agents for Milward's Helix Needles, which were awarded a medal and diploma at the Centennial Exhibition.

SEAVEY, FOSTER, & BOWMAN, BOSTON, MASS.**A W A R D.****PRODUCT: Sewing Silks.**

Commended for great uniformity and general excellence in manufacture of their sewing silks.

J U D G E S.

JOHN L. HAYES.
ELLIOT C. COWDIN.
CHARLES LE BOUTILLIER.
CHARLES J. ELLIS.
J. D. LANG.
CONSUL GUSTAV GEBHARD.*
THEODORE BOCHNER, Jr.
HENRY MITCHELL.

DR. MAX WEIGERT.
LOUIS CHATEL.
CARL ARNBERG.
HAYAMI KENZO.
JOHN G. NEESER.
AUGUST BEHMER.
ALBERT DANINOS.

C L A I M.

The above firm commenced the manufacturing of sewing silk and machine twist in the year 1863, under the firm name of J. W. C. Seavey & Co., having bought the mills and machinery of Messinger Bros., in Canton, Mass. The style of the firm was changed to Seavey, Foster, & Bowman, in 1869; about which time they commenced the manufacturing, and introduction among shoe and clothing manufacturers, of strictly pure-dye machine twist and silk; and, by the use of measuring and strength-testing machines (of their own manufacture and invention), have succeeded in convincing the consumers of these goods of the superiority of "pure dye" over the "heavy dye" or weighted goods universally in use in America at this time. Their different brands of pure-dye goods in twist and sewings, viz., Lion, Eureka, Canton Mills, and Superior, have been and are now considered standards of length and strength in each of the qualities they represent; and nearly all silk manufacturers of any importance have so far adopted their ideas as to make what they call "pure-dye" goods, but which in most cases fall somewhat below the standard. In addition to the above goods, for the use of manufacturers, this firm manufacture and keep in stock the popular and well known Eureka Spool-silk and Button-Hole Twist, for dressmakers and family use. These goods are made with great care from the finest qualities of raw silk; and are warranted full length and full size, and perfectly smooth and even throughout. They also make a complete assortment of embroidery and saddlers' silk and colored sewings and twist for tailors' use.

Offices at 7 Mercer Street, New York; 40 Summer Street, Boston.
GEO. H. FOSTER & Co., 6 Washington Street, Chicago.
Mills at Canton, Mass.

* Signing Judge.

JOHN N. STEARNS & CO., NEW YORK, N. Y.

A W A R D.

PRODUCT: Figured and Twilled Silks.

*A handsome exhibit of brocade silks of superior styles and quality ;
also, twilled silks well made, and meritorious in every respect.*

J U D G E S.

JOHN L. HAYES.

ELLIOT C. COWDIN.*

CHARLES LE BOUTILLIER.

CHARLES J. ELLIS.

J. D. LANG.

CONSUL GUSTAV GEBHARD.

THEODORE BOCHNER, Jr.

HENRY MITCHELL.

Dr. MAX WEIGERT.

LOUIS CHATEL.

CARL ARNBERG.

HAYAMI KENZO.

JOHN G. NEESER.

AUGUST BEHMER.

ALBERT DANINOS.

C L A I M.

We claim to be able to manufacture and sell goods cheaper than others, for the following reasons:—

First, we import our raw silk directly from the place of growth; thus saving the profit of the importer.

Second, we sell all our goods ourselves; thus saving the charges of a commission merchant.

Third, we manufacture the goods in every part ourselves, nothing being done out of our own establishment; thus saving the profits of the dyer, throwster, and finisher.

Fourth, we weave all our goods on power-looms; thus saving largely over the hand-loom process.

Fifth, by a nice adjustment on our looms, we are able to overcome the natural inequalities of China raw silk; thus saving a large percentage between the cost of that and European silk, and without taking away any thing from either the appearance or wear of the goods.

We refer with pride to the award given us by the judges, it being higher than to any other manufacturer; and we defy competition either in quality or price.

* Signing Judge.

FARRINGTON & KINSEY, RAHWAY, N. J.**A W A R D.****PRODUCT: Extract-Wools.**

Extract-wools from old garments of cotton and wool, from which the cotton is destroyed by a chemical process, without injury to the wool.

J U D G E S.

JOHN L. HAYES.
ELLIOT C. COWDIN.
CHARLES LE BOUTILLIER.
CHARLES J. ELLIS.
J. D. LANG.
CONSUL GUSTAV GEBHARD.
THEODORE BOCHNER, Jr.
HENRY MITCHELL.*

Dr. MAX WEIGERT.
LOUIS CHATEL.
CARL ARNBERG.
HAYAMI KENZO.
JOHN G. NEESER.
AUGUST BEHMER.
ALBERT DANINOS.

C L A I M.

Peter S. Kinsey, successor to Farrington & Kinsey, manufacturer of Extract Wool, Rahway, N. J.

Established in 1873. I manufacture an extract wool that is uniform in quality, and in length and strength of staple, and which, by the voluntary testimony of manufacturers who are using the same, is said by them to be "perfectly uniform in every respect," and "the best they have used or seen."

I have never sold my goods to any party whose trade I have not retained,—in many cases with the indorsement, "Your extract wool is superior to any manufactured in England."

A prominent English house had, at the recent Exposition in Philadelphia, an exhibition of wool extract much larger and more costly than my own. The opinion of the judges is shown in the fact, that their exhibit was passed without comment, while a diploma and medal were awarded to mine, coupled with the very important paragraph in their verdict, "Without injury to the wool."

I have much pride in the goods that leave the mill, in the manufacture of which I give my personal supervision; and am determined that in the future, as in the past, they shall afford entire satisfaction. I give a guarantee, to all purchasers, of a strictly uniform and first-class article.

* Signing Judge.

HAMIL & BOOTH, PATERSON, N. J., AND NEW YORK, N. Y.

A W A R D.

PRODUCT: Plain and Figured Silks.

A very fine exhibit of figured dress and millinery silks, plain satins, serges, and silk ribbons, of excellent manufacture and material.

J U D G E S.

JOHN L. HAYES.

ELLIOT C. COWDIN.*

CHARLES LE BOUTILLIER.

CHARLES J. ELLIS.

J. D. LANG.

CONSUL GUSTAV GEBHARD.

THEODORE BOCHNER, Jr.

HENRY MITCHELL.

Dr. MAX WEIGERT.

LOUIS CHATEL.

CARL ARNBERG.

HAYAMI KENZO.

JOHN G. NEESER.

AUGUST BEHMER.

ALBERT DANINOS.

C L A I M.

HAMIL & BOOTH, Silk Manufacturers, Paterson, N. J.,
and 461 Broome Street, New York.

This firm employ about 900 hands in the manufacture of silks; making it in all the forms of threads, tram, organzine, fringe silk, saddlers', and embroidery; and, also, having about 300 broad looms for weaving all varieties of silks, and 50 looms for ribbons.

Their exhibit was of the following goods: organzine silk, in gum, made from French raw silk; tram silk, in gum, made from China raw silk; twist silk, in gum, made from Canton raw silk; embroidering and saddlers' silk, in colors. In piece goods. A gros-grain silk, with velvet figures raised thereon, — the figure partly of cut and partly of uncut velvet, and of a different color from the body of the silk. This fabric was of a most difficult and costly character, and was not surpassed in richness, quality, or skill in manufacture, by any manu-

* Signing Judge.

facturer, either domestic or foreign. This was made in four different combinations of colors, — black and colored velvets. These were probably the first American velvets ever exhibited.

Black and colored gros-grain dress silks; black and colored damassé dress silks; black and colored armures and Ottoman silks, for cloaks and mantillas; broché-tie silks, with seven colors in the piece; brocade-tie silks, and plain-tie silks, in twills, serges, gauzes, *façonnées*, &c.; brocade ties, woven on ribbon looms, of splendid design and colors. All-silk satins, plain and figured handkerchiefs, and mufflers. Silk ribbons in all widths.

In design, colors, durability, quality of silk used, and skill in manufacture, these goods equalled any thing exhibited.

ECONOMY MILLS, PHILADELPHIA, PA.**A W A R D.****PRODUCT: Cotton Warps and Wool Fur Beavers.**

Various grades of cotton warps, and all-wool fur beavers and chin-chillas, of excellent designs, at cheap prices; together with cotton-warp bed and horse blankets, for general consumption, at very low cost.

J U D G E S.**JOHN L. HAYES.*****ELLIOT C. COWDIN.****CHARLES LE BOUTILLIER.****CHARLES J. ELLIS.****J. D. LANG.****Consul GUSTAV GEBHARD.****THEODORE BOCHNER, Jr.****HENRY MITCHELL.****Dr. MAX WEIGERT.****LOUIS CHATEL.****CARL ARNBERG.****HAYAMI KENZO.****JOHN G. NEESER.****AUGUST BEHMER.****ALBERT DANINOS.****C L A I M.**

**ECONOMY MILLS, SEVILL SCHOFIELD, 51 North Front Street,
Philadelphia, Pa.**

We claim for all our varieties of goods, not so much originality in design and construction, as an adaptation in both these particulars, of the leading styles of the market, to general consumption.

In this direction, that is, that of furnishing the multitude with *fac-similes* of high-cost goods, at low prices, yet of good materials, we have led the manufactures of the country for many years; and, with ever-increasing facilities, propose still to do so in the future.

* Signing Judge.

DEXTER, LAMBERT, & CO., NEW YORK, N. Y.**A W A R D.****PRODUCT: Silk Goods.**

Commended for millinery silks, well made, and of good colors; also, for brocade silks, of excellent manufacture.

J U D G E S.

JOHN L. HAYES.

ELLIOT C. COWDIN.*

CHARLES LE BOUTILLIER.

CHARLES J. ELLIS.

J. D. LANG.

CONSUL GUSTAV GEBHARD.

THEODORE BOCHNER, Jr.

HENRY MITCHELL.

DR. MAX WEIGERT.

LOUIS CHATEL.

CARL ARNBERG.

HAYAMI KENZO.

JOHN G. NEESER.

AUGUST BEHMER.

ALBERT DANINOS.

C L A I M.

Commenced business in Boston in 1851; removed to Paterson, N. J., in 1866. Employ 450 hands. Salesroom, 33 and 35 Green Street, New York.

We made no goods specially for the Exposition, but sent samples from our usual stock. We make twill silks for ladies' ties, all kinds of millinery silks, and ribbons; and consider our goods equal in quality, and as low in price, as those of any American manufacturer.

* Signing Judge.

CHARLES N. BACON, WINCHESTER, MASS.**A W A R D.****PRODUCT: Felts.**

An excellent exhibit of felt goods, in great variety and of good fabrication, comprising many novel and ingenious applications.

J U D G E S.

JOHN L. HAYES.*

ELLIOT C. COWDIN.

CHARLES LE BOUTILLIER.

CHARLES J. ELLIS.

J. D. LANG.

Consul GUSTAV GEBHARD.

THEODORE BOCHNER, Jr.

HENRY MITCHELL.

Dr. MAX WEIGERT.

LOUIS CHATEL.

CARL ARNBERG.

HAYAMI KENZO.

JOHN G. NEESER.

AUGUST BEHMER.

ALBERT DANINOS.

MANUFACTURED BY CHARLES N. BACON, WINCHESTER, MASS.

Manufactures as a specialty a patent buffer or burnishing wheel, unlike any thing of this kind made here or abroad. Instead of being made from square sheets of felting with rounded corners, and pressed or cemented together, these wheels are made round and solid, from a pile of fine wool from six to twenty-four inches in thickness, which is reduced in the manufacture to a thickness of from a sixteenth of an inch to three inches; thus saving much valuable raw material, getting rid of the seams in the face of the wheel, and securing the great *desideratum* of solidity and firmness. These wheels are warranted to run ten thousand revolutions to the minute; and are used in the securing of a high finish on gold, silver, steel, ivory, &c.

It is claimed by the European manufacturers of this class of felting that none but Silesian wools can be used. In these wheels, made for the most delicate and costly processes in jewelry and like industries, there are none but American wools consumed. The same may be said of the tapered feltings for piano-makers' uses, and all other first-class goods in this line of industry. The maker fears no comparison with any makers here or abroad. His goods sell as high, and are as much in

* Signing Judge.

demand as those from any quarter ; and, since the exhibition of them at the Exposition, he is having orders from France for the same.

CLAIM.

I claim for my patent buffers or burnishing wheels, which are a specialty with me, economy, safety, and durability in the securing of a high degree of finish on gold, silver, steel, ivory, &c.

I also claim for these wheels an entirely unique character in their construction ; not being made up from square sheets with corners cut rounded, causing a loss of twenty per cent of valuable raw material ; but the manufacture is from a pile of carefully selected wool from six to twenty-four inches in thickness, reduced to a thickness of from one-sixteenth of an inch to three inches, securing solidity and firmness.

I will warrant these buffers to run ten thousand revolutions per minute, with safety.

I also claim for my tapered feltings for piano-makers' uses, and for all my other first-class goods, as good material, thorough manufacture, and low prices, as can be had from any factories here or in Europe. And I am happy to say that my raw material, machinery, and operations are all of home production.

CHARLES N. BACON,

(Successor to JOHN H. BACON.)

FELTING AND WADDING MILL,

WINCHESTER, MASS.

Buffer Wheels, for Rubber and Hardware Manufacturers, Brass Finishers, Nickel Platers, &c.

FELTINGS

For Jewellers, Dental Instruments, Cutlery, Piano-Fortes, Paper-Hangings and Carpet Manufacturers, Calico-Printers, Polishers of Jewelry, Marble, Slate, Brass, Glass, Ivory, &c., and for covering Steam-Boilers and Pipes.

WHITE AND DARK LAMBS' WOOL AND COTTON WADDING

For Furriers, Tailors, Trimming and Thread Dealers.

Cotton Carded to order. Wool and Hair Stuffing and Felt for Harness Makers and others.

CHARLES N. BACON,

(Successor to JOHN H. BACON.)

WINCHESTER, MASS.

Salesroom, 22 Exchange Place, Boston.

WM. H. HORSTMANN, & SONS, PHILADELPHIA, PA.**A W A R D.****PRODUCT: Flags, Insignia, Emblems.**

The undersigned, having examined the product herein described, respectfully recommends the same to the United States Centennial Commission for award, for the following reasons, viz. : —

For the excellency of workmanship, variety of exhibit, and correctness in design.

GEORGE HEWSTON.

(Signature of the Judge.)

Approval of Group Judges.

B. F. BRITTON.
E. N. HORSFORD.
KANITZ.
W. H. CHANDLER.

DIETZ MONNIN.
MODEST KITARY.
W. O. LUITHICUM.
M. P. EMPY.

PRODUCT: Swords.

The undersigned, having examined the product herein described, respectfully recommends the same to the United States Centennial Commission for award, for the following reasons, viz. : —

For elegance of finish and fabrication.

HENRY L. ABBOTT,

Brevet Brig.-General U. S. A.

(Signature of the Judge.)

Approval of Group Judges.

W. H. NOBLE.
S. C. LYFORD.

LUIZ DE SALDANTRA.
ALPHONSE LESNE.

A true copy of the record.

FRANCIS A. WALKER,

Chief of the Bureau of Awards.

Given by authority of the United States Centennial Commission.

A. T. GOSHORN, Director-General.

J. R. HAWLEY, President.

J. L. CAMPBELL, Secretary.

The United States Centennial Commission has examined the report of the judges, and accepted the following reasons, and decreed an award in conformity therewith.

PHILADELPHIA, Jan. 16, 1877.

REPORT ON AWARDS.

PRODUCT: Dress, Carriage, and Upholstery Trimmings.

Name and Address of Exhibitor:

WM. H. HORSTMANN & SONS,

PHILADELPHIA.

The undersigned, having examined the product herein described, respectfully recommends the same to the United States Centennial Commission for award, for the following reasons, viz: —

For a splendid exhibit of dress, carriage, and upholstery trimmings, of great excellence and beauty in style, material, and execution; also, for a very handsome and complete assortment of woollen and mohair yarns, known to the trade as Germantown, Cashmere, Saxony, Shetland, and Balmoral yarns, of brilliant colors, variety of shades, and regularity of spinning.

GUSTAV GEBHARD.

(Signature of the Judge.)

Approval of Group Judges.

ELLIOT C. COWDIN.

JOHN G. NEESER.

CHARLES LE BOUTILLIER.

JOHN L. HAYES.

CHARLES J. ELLIS.

JOHN D. LANG.

HENRY MITCHELL.

FRANCIS A. WALKER,

Chief of the Bureau of Awards.

Given by authority of the United States Centennial Commission.

A. T. GOSNORN, *Director-General.*

J. R. HAWLEY, *President.*

J. L. CAMPBELL, *Secretary.*

WM. H. HORSTMANN & SONS.

PHILADELPHIA 5th and Cherry Streets.

NEW YORK 410 Broadway.

MANUFACTURERS OF

LADIES' DRESS AND CLOAK TRIMMINGS,
UPHOLSTERY, CARRIAGE, AND MILITARY TRIMMINGS,
SOCIETY-REGALIA, SWORDS, FLAGS, &c.,
GERMANTOWN AND OTHER KNITTING YARNS.

The house of Wm. H. Horstmann & Sons was established by Wm. H. Horstmann, a native of Cassel, Germany, who arrived in this country, at Philadelphia, in May, 1815, and at once began the manufacture of coach-laces, fringes, gimps, trimmings, buttons, &c., having previously learned the art of silk-weaving in France.

In 1824, Wm. H. Horstmann introduced into this country the braid-
ing machine from Germany, and the Jacquard machine from France.

In 1838, he built power-looms of his own design, and began power-
loom weaving for narrow textile fabrics simultaneously with the first
power-looms in Basle, Switzerland.

In 1840, he admitted his two sons, William J. and Sigmund H.
Horstmann, into partnership with him; and the name of the firm, of
Wm. H. Horstmann & Sons, thus formed, remains unchanged to this
day.

In 1852, received a gold medal and a special report from the Frank-
lin Institute of Philadelphia, at their exhibition of that year. In this
year the factory at 5th and Cherry Streets was built, the business being
previously accommodated in their large mill at Fifth and Columbia
Avenue.

In 1869, received an award from the American Institute of New
York.

In 1874, an award from the Franklin Institute of Philadelphia.

At the Centennial International Exhibition of 1876, received three
awards and diplomas. (See preceding page.)

In 1866, began getting up woollen yarns, known to the trade as
Germantown, Cashmere, Saxony, Shetland, and Balmoral yarns; and
which, from a small beginning, soon grew to be quite an extensive
business, and at this time the brand of "Columbia" yarns is favorably
known throughout the United States.

MARTIN LANDENBERGER'S SONS, PHILADELPHIA, PA.

A W A R D.

PRODUCT: Dress Goods and Shawls.

A brilliant exhibit of fancy worsted dress goods and shawls, both knit and woven; the latter original in design and process of manufacture. The India styles are especially creditable for novelty and tastefulness of design and moderate prices.

J U D G E S.

JOHN L. HAYES.
ELLIOT C. COWDIN.
CHARLES LE BOUTILLIER.
CHARLES J. ELLIS.
J. D. LANG.
CONSUL GUSTAV GEBHARD.
THEODORE BOCHNER, Jr.*
HENRY MITCHELL.

Dr. MAX WEIGERT.
LOUIS CHATEL.
CARL ARNBERG.
HAYAMI KENZO.
JOHN G. NEESER.
AUGUST BEHMER.
ALBERT DANINOS.

C L A I M.

Martin Landenberger, the founder of this vast concern, is a native of Germany; but came to America in his youth, and learned his business in this city. He first commenced for himself, in a small store at St. John and Green Streets, in 1843; and, applying himself as a practical mechanic to producing only the very best article, he succeeded in slowly laying the basis of his eventual success in the manufacture of hosiery, knit goods, shawls, &c. The beginning of this business was hosiery, in which the preference for the foreign article was not marked. From this, Mr. Landenberger gradually made his way to fancy-knit goods, and at length boldly attempted to compete with foreign woollen shawls. He did not copy the foreign designs and styles, nor has he ever done so; and this made it difficult at first to get his shawls into a fair market. He asked, as a favor, that his shawls might be placed in the stores side by side with the foreign articles, and let the buyers judge for themselves as to style and quality. The result indicated the

* Signing Judge.

soundness of his judgment. His shawls attained reputation, got into demand, and soon took possession of the market. No foreign shawls can now compete with them. With this success before him, Mr. Landenberger pushed his manufactures into various lines of women's dress goods and cloths and cassimeres, &c., for men's wear, in all of which he attained an immense success. In these, as in shawls and fancy-knit goods, Mr. Landenberger has still preserved the same merit of using only his own styles and patterns and designs. As for any inferiority to foreign fabrics, it exists only in the imagination. The success of such products will account for the rapid diminution of our foreign imports. Mr. Landenberger has two large mills in Kensing-ton, and two at the village of Landenberg, Chester County, Pa.,—named after him, and owing its existence to his energy. The Kensing-ton works were begun in 1856, and were removed from Fourth and George Streets to their present location. The concern uses American wool, the quality of which is excellent; so that we can produce both the raw material and the finished article at home, of the best grades. The mills employ about 800 hands, and use annually from 600,000 to 800,000 pounds of wool. Mr. Landenberger has taken a large and active share in the public movements of this city, and contributed extensively to the employment of the working-classes, the enhancement of the prestige of the city as an industrial emporium, to its trade and commerce, and the success of its railroads. But, in the direct line of his own business, we are inclined to think that other triumphs are yet in store for a concern that has displayed such true American grit in the competition against foreign goods in lines where the preferences of fashion were almost invincible. If it were not for that difficulty, there are no lines of worsted-dress goods or men's wear within the range of his works in which he could not drive the foreign articles out of the market. That this time is coming, we see in the known fact that American ladies now buy and wear American silks readily enough. But is there any thing that can overcome the prejudices of men and women who have their attire made in London and Paris? Perhaps we are revealing no trade secret when we say, that millions of dollars' worth of American dry goods are now sold with foreign labels.

A. G. JENNINGS, NOTTINGHAM LACE WORKS, BROOKLYN, N. Y.

A W A R D.

PRODUCT: Silk Laces.

Commended as an attractive exhibit of guipure, cashmere, and other laces and trimmings; also, for a general assortment of net goods, highly commendable for excellent fabrication. This exhibit is noticeable as illustrative of an important manufacture just introduced into the United States by the exhibitor.

J U D G E S.

JOHN L. HAYES.
ELLIOT C. COWDIN.
CHARLES LE BOUTILLIER.*
CHARLES J. ELLIS.
J. D. LANG.
CONSUL GUSTAV GEBHARD.
THEODORE BOCHNER, Jr.
HENRY MITCHELL.

DR. MAX WEIGERT.
LOUIS CHATEL.
CARL ARNBERG.
HAYAMI KENZO.
JOHN G. NEESER.
AUGUST BEHMER.
ALBERT DANINOS.

C L A I M.

NOTTINGHAM LACE WORKS, Park Ave. & Hall St., Brooklyn, N. Y.,

A. G. JENNINGS, Proprietor.

Office and Salesroom, 428 Broome Street, N. Y. City.

These works have been established for more than ten years. The building now occupied by them was erected in 1871, and is large and substantial, well adapted in every respect for the manufacture of laces.

The lace machines are of the most approved patterns; and were all, with one exception, made in England; and cost, aside from the building, engines, boilers, dye-works, &c., over one hundred thousand dollars (\$100,000).

The designers, draughtsmen, and operatives are from England and France, and are skillful in their several branches.

* Signing Judge.

The products of the works are principally silk guipure laces, for trimming dresses and over-garments ; black thread and silk blonde laces, for dress and millinery trimmings ; Spanish and cashmere laces, Brussels spot-net and Grenadine veillings ; also silk purling, for trimming and embroidering.

Their silk-lace ties and scarfs, which are made in great varieties of patterns, and in all desirable shades and colors, are the most fashionable in the market, and in great demand ; the largest houses in the trade giving them a decided preference over any that are imported, thereby saving two or three profits, which have to be paid by the importer.

The laces and lace goods are made entirely of pure silk. Their value is thus not only enhanced, but more perfect goods are made ; and their color, when dyed, is in every respect bettered by the use of pure silk.

The Nottingham Lace Works is the first of its kind in the country ; and this new industry, in America, of making laces, may now be considered as permanently established.

CRANE BROTHERS, WESTFIELD, MASS.**A W A R D.****PRODUCT: Paper.**

This exhibit contains ledger and flat-cap and letter papers; all of which are thoroughly sized and of very superior strength. Their other qualities are excellent.

J U D G E S.

JAMES M. WILCOX.
C. O. CHAPIN.
WILLIAM FAXON.
EDWARD COULEY.

H. T. BRIAN.
SIR SIDNEY H. WATERLOW.
G. W. SEITEZ.

C L A I M.

THE JAPANESE MILLS; the Manufacture of Bank-Ledger and Record Papers, &c., by the

Messrs. CRANE BROTHERS, Westfield, Mass.

Among the leading manufacturers of Westfield are the Messrs. Crane Brothers, whose large establishment for the manufacture of "bank-ledger and record papers," and specialties in "long linen fibre papers," is situated on Little River, about one and a half miles from the station on the Boston & Albany Railroad, and a mile from the business centre of Westfield. The mill is owned and managed by Robert B. and James A. Crane, both sons of James B. Crane, of Dalton; and they are representatives of the third generation of Cranes who have been engaged in paper manufacture in the western part of this State. Zenas Crane, the original Crane paper-maker, commenced the manufacture of paper, by hand, in Dalton, in 1801. He was succeeded by his sons, who are at present very successful manufacturers, on the original mill site. And Crane Brothers, who are grandsons, and subject of this sketch, established themselves in 1867. This firm devotes itself more particularly to the manufacture of ledger or blank-book papers, and cater for the best trade in the country in these lines of goods; and so thoroughly is their reputation established that their goods are known and used in almost every city in the country, and received the prize medal at the late Centennial Exposition. The location of their mills is an admirable one, having a good water-power and the very best of spring water, which is conducted about three-fourths of a mile from "Wolf Pit Springs;" which supplies an unfailing amount

of water, as clear as crystal, and eminently adapted for use in the manufacture of the fine papers turned out by this mill.

The capacity of the mills at present is two tons of ledger papers daily; and the operations of the different stages of manufacture are carried on in a substantial brick mill, erected after the destruction of the old mill by fire in 1870. Every appliance for producing perfect paper is added by the firm, and every precaution taken to keep the standard of the trade-mark up to its high reputation in the past. The styles of bank-ledger and record papers turned out by the firm include "crown, demy, medium, royal, super-royal, imperial, and all other grades known to the trade; full lines of sizes being always kept in stock, and all the goods are warranted. The firm have all their paper water-marked with a "crane," and each sheet has the year of its manufacture stamped upon it.

This firm exhibited at the late Centennial in three different buildings. In the main building stationary department, they had a fine, pyramidal case, which contained thirty-six reams of the bank-ledger and record paper, of different sizes,—Atlas, double-medium, &c., to packet note, white and blue wove; making altogether a pile of paper some ten feet high, each ream of which was tied up in red and blue ribbons. They claimed for their goods *superior strength, sizing, writing, and erasing qualities*; all of which met with the approval of the judges after a severe test and examination, and they were awarded the highest award, with the following report: "This exhibit contains ledger, flat-cap, and letter papers, all of which are *thoroughly sized* and of *very superior strength*. Their *other qualities* are *excellent*."

PAPER BELTING AND BASKETS.

This firm have, in addition to their manufacture of ledger and record papers, opened up another source of income, by securing all the patents covering the use of paper for belting and baskets, and are now largely engaged in this new and important branch of manufacture; having, after much trial, trouble, and expense, perfected this style of using paper.

The process by which the baskets are made consists of feeding an endless apron of paper pulp upon a cylinder of the size desired for the basket. By this means, the basket is a seamless belt of paper, which when hardened has the toughness and durability of a sheet of raw hide. The stock used for the pulp being linen. The baskets are, after being dried over forms, coated with shellac, paint, varnish, or enamelled, and are as impervious to water as though they were made

of rubber. The bottom of the basket is formed of successive layers of paper crossed in the fibre; and, when dried, the whole framework is of one sheet. The baskets are made perfectly smooth, inside and out; and neither collect dust and dirt, nor chip as the ordinary splint basket in common use in mills and warehouses.

The Crane Brothers exhibited these goods in a fine large space in Carriage Annex. Here were seen baskets of all sizes and shapes, from twenty bushels, oblong, and on wheels, to one-half peck, round baskets. Their claim was for their water-proof qualities, lightness, and durability; and for all these qualities the judges awarded them a medal, and the following report: "This is an exhibit of paper baskets. They are light, water-proof, and well adapted for use in cotton, wool-len, silk, carpet, and paper mills."

PAPER BELTING.

The difficulty of procuring serviceable belting is one of the greatest trials of the manufacturer; and the Messrs. Crane have applied this novel invention to the removal of this difficulty, and have succeeded in producing an article of belting which will compare favorably with the best oak-tanned, and will in many ways surpass the best makes of leather belting. For use upon a large pulley, this style of belt is particularly adapted; and it will be found to be tight after years of wear, where the best leather belts would have required continual taking up and relacing. These belts have been in use for about ten years, and are no longer an experiment.

In walking through Machinery Hall, at the late Centennial Exhibition, one could not have failed to see signs calling attention to Crane Brothers' paper belts, ten of which they had running during the entire exhibition, driving heavy machinery. One, a twelve-inch belt, near the Corliss engine, drove a long line of shafting, attached to which was machinery which required at least fifty-horse power to drive; yet this belt, though running on a sixteen-inch diameter pulley, did the work without slipping or jumping, and was laced together the same as leather would have been. Other belts were used driving the Lockwood Envelope Machine, and machinery connected with the Gavit Machine Company's exhibit, Fourdrinier Machine, Web Calender, &c.

Aside from these belts in actual use, the company had an exhibit of the belting in rolls in the carriage annex, with their baskets, paper trunks, &c. For this exhibit of belting in actual use, the judges awarded a medal, and report as follows: "The paper belting exhibited possesses considerable tensile strength and a fair degree of pliability. The exhibit shows that belts can be cheaply made of paper."

BIGELOW CARPET COMPANY, CLINTON, MASS.

THE ORIGINAL MANUFACTURERS OF BRUSSELS AND WILTON CARPETS
BY POWER-LOOMS.

A W A R D.

PRODUCT: Brussels and Wilton Carpets.

A brilliant display of Brussels and Wilton carpets, in material, texture, design, and color possessing all the elements of the highest manufacture; the Wiltons especially conspicuous for chasteness of design and perfection of fabrication.

J U D G E S.

ELLIOT C. COWDIN.*	Dr. MAX WEIGERT.
JOHN L. HAYES.	LOUIS CHATEL.
CHARLES LE BOUTILLIER.	CARL ARNBERG.
CHARLES J. ELLIS.	HAYAMI KENZO.
J. D. LANG.	JOHN G. NEESER.
CONSUL GUSTAV GEBHARD.	AUGUST BEHMER.
THEODORE BOCHNER, Jr.	ALBERT DANINOS.
HENRY MITCHELL.	

The carpets for which this award was made were not manufactured specially for the Exhibition; but were taken from the company's stock on hand at that time, and fairly represent its regular production.

The first power-loom factory for the production of Jacquard Brussels and Wilton carpets known in the history of industrial art, was established in Clintonville (now Clinton), Massachusetts, in 1848, and was operated with success by its founders.

In 1854, the Bigelow Carpet Company, organized under a special charter granted by the State, purchased the works and franchise of the concern just mentioned; and thus assumed the rôle of pioneer in this important branch of manufacture, in which it has continued to take the lead.

The company's works are complete in all respects. They take the wool in the bale, manufacture it into worsted, dye it the various colors required, and fabricate it into carpets. The several mills contain an

* Signing Judge.

aggregate floor area of over six acres, and are equipped throughout with the most approved machinery. This establishment is the growth of more than a quarter of a century; and is now the largest in the world for the manufacture of Jacquard Brussels and Wilton carpets, in which the several processes of worsted spinning, dyeing, and weaving are united in one concern.

In weaving, the company has a decided advantage over all other manufacturers, it having obtained the exclusive right of using Mr. E. B. Bigelow's new patented loom; which produces a smoother face, a closer texture, and, consequently, a more sightly and durable carpet, than any other loom.

For dyeing or coloring, the most approved methods and appliances are used. The question is sometimes asked, in regard to "Bigelow carpets," "Will the colors stand?" We unhesitatingly answer, "Yes, as well as the colors in any foreign carpets will stand." All that applied chemistry, practical skill, and long experience can do in making fast colors, is brought into requisition by this company.

The highest artistic skill is employed in designing patterns, and in determining styles; and carpets of *special patterns* are made when required.

With these superior facilities for manufacturing, the Bigelow Carpet Company can execute large or small orders, for Jacquard Brussels and Wilton carpets and rugs, at short notice. And purchasers can rely on their goods being in no respect inferior, and in some respects superior, to all others of that class, whether of foreign or domestic manufacture.

OFFICERS.

ERASTUS B. BIGELOW	<i>President.</i>
CHARLES F. FAIRBANKS	<i>Treasurer.</i>
HENRY N. BIGELOW	<i>Manufacturing Agent.</i>
WILLIAM B. KENDALL	<i>Selling Agent.</i>

All orders for goods are executed at their Warehouse,
Nos. 100 and 102 WORTH STREET, NEW YORK CITY.

President and Treasurer's Office,
No. 9 SIMMONS BUILDING, WATER STREET, BOSTON.

SHAFFNER & STRINGFELLOW, PHILADELPHIA, PA.**A W A R D.****PRODUCT: Germantown Wool.**

A handsome variety of Germantown wool and zephyr yarns, in beautiful colors, and very neatly made up in a special style of ball, weighing one ounce each.

J U D G E S.

JOHN L. HAYES.	Dr. MAX WEIGERT.
ELIOT C. COWDIN.	LOUIS CHATEL.
CHARLES LE BOUTILLIER.	CARL ARNBERG.
CHARLES J. ELLIS.	HAYAMI KENZO.
J. D. LANG.	JOHN G. NEESER.
Consul GUSTAV GEBHARD.	AUGUST BEHMER.
THEODORE BOCHNER, Jr.	ALBERT DANINOS.
HENRY MITCHELL.*	

C L A I M.

The manufacture of knitting cotton, known as "Stringfellow's Knitting Cotton," was commenced in the year 1851 by S. F. Stringfellow, from whom the name was taken to designate it from other makes. With but a small capital, and an eye single to making it unequalled in this country; with strong competition and great discouragements, — it steadily made its mark in the market; until now, having increased in demand from 100 lbs. production per day until at present production of 1,000 lbs. per day, with fair prospects of a further increasing demand, in addition to having reached the position as one of the leading cottons in the United States.

The Germantown wool was commenced in like manner, under the firm of Peltz & Stringfellow, in the year 1869, in a small way, with the same object in view, — of excelling in quality; and in 1873, at the closing up of the above firm, the present firm (Shaffner & Stringfellow), Mr. John Shaffner, well known in the notion trade, purchased the interest of Mr. Peltz. Since that time, with the same view as above stated, have made it one of the leading articles in the market, with a constant increasing demand.

Factory: Nos. 1210 & 1212 South Twelfth St., Philadelphia, Pa.

* Signing Judge.

NONOTUCK SILK COMPANY, FLORENCE, MASS.**A W A R D.****PRODUCT: Sewing Silk and Silk Machinery.**

A splendid exhibit of a variety of sewing silks and machine twist of great superiority as to strength and regularity, evincing extreme care in the manufacture; also, a fine collection of silk machinery, embracing winding, doubling-spinning, and reeling machines, and spool-finishing machines, the latter of very ingenious construction.

J U D G E S.

JOHN L. HAYES.
 ELLIOT C. COWDIN.
 CHARLES LE BOUTILLIER.
 CHARLES J. ELLIS.
 J. D. LANG.
 Consul GUSTAV GEBHARD.*
 THEODORE BOCHNER, Jr.
 HENRY MITCHELL.

DR. MAX WEIGERT.
 LOUIS CHATEL.
 CARL ARNBERG.
 HAYAMI KENZO.
 JOHN G. NEESER.
 AUGUST BEHMER.
 ALBERT DANINOS.

CLAIM.

THE NONOTUCK SILK Co., Florence, Mass.
 (Established in 1838.)

At the late Centennial Exhibition, sewing silk was one of the few American products of a century's growth.

The early efforts of the silk industry in this country date back something over one hundred years. Previous to 1827, sewing silk was made only upon the hand-spinning wheel, and was of inferior quality.

In 1827, machinery was introduced, which proved so far a success that the manufacturing of sewing silk upon machinery has been uninterruptedly perpetuated; maintaining a sure and steady growth, marked throughout by improvements in machinery; also, in the quality of goods manufactured.

Previous to the introduction of machinery, the quality of American

* Signing Judge.

sewing silk was so poor that it was universally condemned by consumers. Italian sewing silk, being of superior quality, was in general use : hence, it became the effort of the first producers of sewing silk upon machinery to make a quality equal to that of the Italian.

To accomplish this, only those who were pioneers in the enterprise can ever appreciate the trials attending the effort. Simple as the process may appear to-day, it has only been accomplished by long and practical application.

Difficult as it was for the American manufacturer to perfect the quality of sewing silk in the skein, suitable for tailors' use, it was not until the introduction of the sewing-machine that the skill of the American manufacturer was put to the test. The sewing-machine required silk for its use put upon spools, and of a special manufacture.

The Nonotuck Silk Company were the first to meet this demand. Knowing, as they did, the difficulties attending the use of silk thread upon the newly invented sewing-machine, they were moved to offer, in February, 1852, one pound of three-cord silk, on spools containing one and one-half ounce each, twisted the opposite of common or skein sewing silk, to I. M. Singer, who at that time was located in Boston, experimenting upon his machine, which was attended with trouble in sewing he could not overcome. The silk was handed to Mr. Singer, with the request that he would try it.

He put a spool on to his machine, threaded up, and commenced sewing. After sewing sufficient to enable him to judge of its merit, he stopped, and, after examining the work it had done, exclaimed, "Can you make any more like this?" (addressing the agent, who stood watching the result with great interest.) "I shall want all that you can make," — a prophecy literally verified. "He had found it." It assumed the name of *machine twist*; and, from that time to the present, the amount of silk consumed upon sewing-machines is marvellous. A new enterprise was born, which created an industry giving labor to many thousands. In this first experiment of machine twist, the invention was complete; but the manufacturer found great trouble attending its production. It was soon learned that a machine twist which would give satisfaction to the consumer must, like the machine itself, be perfect.

To put upon a spool one ounce of silk thread of continuous length, even in size throughout, entirely free from slugs, knots, rough and uneven places, — in short, to have it every way perfect, — seemed for a long time to be attended with insurmountable difficulties. The Nonotuck

Silk Company took the lead in this new manufacture, and have maintained it to an eminent degree up to the present time.

They have ever been tenacious and exacting in maintaining strictly a uniform standard in the different brands they have manufactured. Their trade-marks are, Nonotuck, Corticelli, Bartolini, and Clark's Pure Dye. In these different brands, quantity and quality are guaranteed to the dealer and consumer to be all that is represented, which is undoubtedly the secret of their success, and the enviable reputation which they enjoy. The members of this company are all practical men ; all, each and every one of them (except their venerable chief, S. L. Hill, who is forced, in consequence of poor health, to retire), take an active position.

Their dyeing is conducted by one of their members ; and who is to-day the oldest American silk-dyer, having been in uninterrupted practice since 1842. They have also in other members accomplished machinists and inventors ; also, those representing the oldest experience, as Americans, in the manufacture of sewing silk and machine twist. They have the managing talent, rendered valuable by long experience, not only in the manufacturing processes, but in the purchasing of the raw material ; also, in selling their products ; and the financial.

It cannot but be gratifying to the members of this company, — pioneers, as it were, in the silk industry of America, — that they should receive from the Judges of Award the marked and approving report upon their exhibit of sewing silk and machine twist.

WEYBOSSET MILLS, PROVIDENCE, R. I.

A W A R D.

PRODUCT: Fancy Cassimeres.

Three-quarters fancy cassimeres, of substantial make and tasteful designs, at moderate cost, adapted for general use.

J U D G E S.

JOHN L. HAYES.
ELLIOT C. COWDIN.
CHARLES LE BOUTILLIER.
CHARLES J. ELLIS.*
J. D. LANG.
CONSUL GUSTAV GEBHARD.
THEODORE BOCHNER, JR.
HENRY MITCHELL.

Dr. MAX WEIGERT.
LOUIS CHATEL.
CARL ARNBERG.
HAYAMI KENZO.
JOHN G. NEESER.
AUGUST BEHMER.
ALBERT DANINOS.

C L A I M.

Bradford & Taft leased Farnum's old No. 3 Mill at Waterford, Mass., in the year 1852, for the manufacture of fancy cassimeres. The business was continued by Bradford, Taft, & Co., in 1856; and they leased the Central Mill at Uxbridge, Mass., in 1859.

The firm of Taft, Weeden, & Co. was formed in 1864, by Royal C. Taft, Wm. B. Weeden, and James W. Taft. This firm discontinued the Waterford business in 1866, and the Uxbridge business in 1868. They leased the new mill at Woonsocket, of Edward Harris; and conducted it, in joint interest with the owner and J. C. Howe & Co., until 1873.

In the year 1864, Taft, Weeden, & Co. bought of R. & J. Peckham a stone mill, built by John Waterman, in 1836, in the westerly part of Providence, R. I. They removed the cotton machinery, built a brick mill for dyeing and other processes accessory to the manufacture of cassimeres. Mr. Wm. A. Walton has been Managing Superintendent from the starting of the mills to this date. The "Weybosset Mills" was incorporated in 1866. Taft, Weeden, & Co. own all the stock and conduct the business as agents. In 1872, both buildings were extended and improved. No. 2 Mill (used for assorting, dyeing, picking, &c.) is 90 by 48 feet, three storied, with a one-storied addition 68 by 20 feet. The main mill, with its two wings, is 492 by 50 feet, and four stories in height.

The two buildings contain 112,720 square feet of floor surface.

The power is furnished by two Corliss engines, cylinders 20 inches in

* Signing Judge.

diameter, with four upright tubular boilers. 1,975 tons of coal were consumed from April 1, 1876, to April 1, 1877.

Twenty-five sets of 48-inch carding-machines and 135 six-quarter chain-loom, with complete equipment for preparation and for finishing, are now in operation. The whole establishment has run full-working time since December, 1864; and no machinery has ever been stopped, except for necessary repairs.

The number of operatives employed is now 445; of whom 285 are males, and 160 females.

The product, from April 1, 1876, to April 1, 1877, was 1,215,527 yards.

The wools used are from Ohio and Pennsylvania, with an occasional lot from Michigan and Wisconsin. Latterly, Texas and California growths have been introduced; Australian and New Zealand, Monte Video and mestiza wools have been imported directly, or purchased here. At one time the company ran its own pulling factory upon Monte Video pelts.

All the goods produced, excepting seconds and remnants, have been sold by J. C. Howe & Co., and their successors, Wendell, Hutchinson & Co., in New York and Boston.

The goods are made for "men's wear," and are cassimeres of fanciful design; that is, the corporation has rarely made cassimeres of a "staple" character such as run in the same design from season to season. It always aims at novelties, and the patterns are constantly changing. These peculiar characteristics of the "Weybosset" goods are well known to the trade throughout the country. They are sold to manufacturing clothiers, and to those cloth jobbers who distribute to the small clothiers. The established standing of these goods caused them to be imitated by many other mills, — sometimes in similar fabrics, and sometimes with a similar design in inferior quality. In consequence of this, the success of the goods became in one sense a disadvantage.

If the fabric was good and the design popular, the imitations were more frequent and audacious; and the business was actually injured by the reputation and standing it had acquired for itself. Accordingly, the corporation resorted to the law, and for several years has protected, by letters-patent, its most important patterns, whenever the same have been original and of its own invention.

It has devoted much attention and careful study to the whole matter of design.

Formerly the patterns of cassimeres were imitated from foreign goods, almost exclusively. Every season now gives us a wide departure from this course. The American market has its own characteristic taste: the mill does not now base five per centum of its product on foreign designs.

The Weybosset Mills has striven to keep its fabric regular and even in quality; adapting it to the wants of the trade, but never changing on account of the fluctuating prices of wool.

Since 1868, the company has accumulated goods only between the selling seasons. During the season of sales, the product has been engaged upon orders in advance of the looms.

AWARDS AND CLAIMS

M. HEMINWAY & SONS SILK CO., NEW YORK, N. Y.
REPORT.

A full assortment of colored and black machine and sewing silk perfect in quality of material, color, and workmanship.

JUDGES.

JOHN L. HAYES.
ELLIOT C. COTTON.
CHARLES LE ROUXILLIER.
CHARLES J. ELLIS.
J. D. LANG.
CONSUL GUSTAV GESSARD.*
THEOPHORE BACHNER, Jr.
HENRY MITCHELL.

Dr. MAX WIEGERT.
LOUIS CHATEL.
CARL ARFBERG.
HAYAMI KENZO.
JOHN G. NEESER.
AUGUST BEHNER.
ALBERT DANFORD.

CLAIM.

Our goods having been thoroughly examined by the judges on silks at the late Exhibition, we herewith attach a certified copy of their report.

M. HEMINWAY & SONS SILK COMPANY.
H. HEMINWAY, Treasurer.

The United States Centennial Commission has examined the report of the judges, and assented the following reasons, and decreed an award in conformity therewith.

REPORT ON AWARDS

PHILADELPHIA, Nov. 13, 1876

PRODUCT: **Sewing Silk.**

Verdict of the Commission

M. HEMINWAY & SONS SILK COMPANY.

The Commission, having examined the product herein described, and the merits of the same, has recommended the same to the United States Centennial Commission for the following reasons:—

*For a full assortment of colored and black machine and sewing silk,
perfect in quality of material, color, and workmanship.*

Signed GEBHARD, Judge.

Approval of Group Judges.

CHARLES LE BOUTILLIER.

A. BEHMER.

CHARLES J. ELLIS.

JOHN G. NEESER.

ELLIOT C. COWDIN.

HAYAMI.

A. DANINOS.

JOHN L. HAYES.

A true copy of the record. Signed by

FRANCIS A. WALKER,

Chief of the Bureau of Awards.

Given by authority of the United States Centennial Commission.

A. T. GOSHORN, *Director-General.*

J. R. HAWLEY, *President.*

J. L. CAMPBELL, *Secretary.*

FAXON & WRIGHT, PHILADELPHIA, PA.

A W A R D.

PRODUCT: Extract of Wool.

A creditable exhibit of extract of wool, prepared by a chemical process not disclosed, together with yarn made from same, illustrating the excellence and strength of the prepared fibre.

J U D G E S.

JOHN L. HAYES.
ELLIOT C. COWDIN.
CHARLES LE BOUTILLIER.
CHARLES J. ELLIS.*
J. D. LANG.
CONSUL GUSTAV GEBHARD.
THEODORE BOCHNER, Jr.
HENRY MITCHELL.

DR. MAX WEIGERT.
LOUIS CHATEL.
CARL ARNBERG.
HAYAMI KENZO.
JOHN G. NEESER.
AUGUST BEHMER.
ALBERT DANINOS.

C L A I M.

The Philadelphia Woollen Manufacturing Co. (late Faxon & Wright), Manufacturers of Extract (dyed all colors), 676 and 678 North Broad Street, Philadelphia.

For many years attempts have been made, by various processes, to extract the wool from mixed rags, so that it could be rewoven into new fabrics. In most cases, however, these experiments have proved a failure; while the best of them have been only partially successful, the wool so extracted being unfit for general purposes, and its use restricted to cheap blankets, rugs, and carpets. The fibre in the most perfect samples hitherto produced was harsh and brittle, in others so injured by chemical action as to crumble away after having been bagged a short time; while in all cases it lacked felting properties, and the staple was so short that it could not be worked without the admixture of new material.

We have pleasure in announcing that we have succeeded in perfecting a process by which the above-named defects are overcome; and are now producing wool extract of a superior quality, the staple of which is so soft, long, and perfect, that it can be used in the manufacture of

* Signing Judge.

broadcloth, doeskins, and other fine goods. No trace of chemical action can be found by analysis; and microscopical examination has proved that the fibre is uninjured. It has been spun, without any admixture of live wool or other material, into yarns of very fine quality; and substantial fabrics have been woven exclusively from such yarns.

A further element in our success consists in the fact that the wool extract manufactured by our new process can be dyed any color. Hitherto, on account of the methods adopted, and the nature of the rags used in making wool extract, black and brown colors only have been produced. We have succeeded in dyeing the wool manufactured by us every shade, from black to the more delicate colors of scarlet and canary.

There only remains to be considered the question of price. Although our extract, on account of its fine, soft, and strong fibre, can be used in the manufacture of the finest goods, it can notwithstanding be supplied to manufacturers at prices that will, on trial, soon convince them of the saving effected by its use; and, if it is taken into account that the extract is already scoured and carded, its economy will be further apparent.

Samples of our wool extract (dyed all colors), together with some fine yarns spun, and pieces of cloth woven exclusively from it, were on exhibition in the United States Department of the Main Building of the International Exposition, 1876. They excited much admiration, and for them we received the Grand Medal of Progress and Diploma of Honor, — the highest award made by the judge, — a verbatim copy of which will be found below.

We shall be pleased to forward samples and prices to manufacturers who have not yet examined our extract; feeling confident that we shall be favored with their orders, after an inspection of its beauty and fibre.

IVANHOE MANUFACTURING CO., PATERSON N. J.

A W A R D.

PRODUCT: Paper.

This exhibit contains thin, super-calendered book-paper, both white and toned; white and colored folios, known as French folios; and copying paper. The thin book-papers are among the best on exhibition; the French folios remarkable for all the desirable qualities in such papers, viz., beauty, finish, strength, and good sizing; and the copying paper, of remarkably good color and finish, and the best white paper of its kind exhibited.

J U D G E S.

JAMES M. WILCOX.
C. O. CHAPIN.
WILLIAM FAXON.
EDWARD CONLEY.

H. T. BRIAN.
SIR SIDNEY H. WATERLOW.
G. W. SEITZ.

C L A I M. ,

H. V. Butler, Jr., & Co., of 34 Reade Street, New York, are the General Agents of the Ivanhoe Manufacturing Company, and supply all the goods of their make. In addition to the papers named in the above award, they make superfine book papers, white and colored; tub-sized, flat writing papers; a line of fine-laid writing papers in colors; drawing papers; and make a specialty of tub-sized writing papers in rolls.

TILESTON & HOLLINGSWORTH, BOSTON, MASS.

A W A R D.

PRODUCT: Plate and Chromo Paper.

This exhibit contains steel plates, chromo and wood-cut papers, calendered and super-calendered. The thickest of these, which are the most difficult to manufacture, leaves nothing to be desired. It is sufficient to say of the entire exhibit that it is exceptionally superior in every respect.

J U D G E S.

JAMES M. WILCOX.
C. O. CHAPIN.
WILLIAM FAXON.
EDWARD CONLEY.

H. T. BRIAN.
SIR SIDNEY H. WATERLOW.
G. H. SEITZ.

C L A I M S.

The first paper-mill in New England was erected in Milton, on the right bank of the Neponset River, near the lower bridge. It went into operation in 1730; and from that time till the present, almost without interruption, paper-making has been carried on on this river, and has become more and more an important industry. All the mills on the Neponset are now owned by one firm. The firm of Tileston & Hollingsworth was formed, in 1801, by Edmund Tileston and Mark Hollingsworth; and the manufacture of paper has been carried on by them and their descendants to this day. In 1831, the original proprietors took into partnership their sons, Edmund P. Tileston and Amor Hollingsworth, and the firm thus constituted continued the business until the death of the elder Tileston, in 1834. The elder Hollingsworth retiring the following spring, the younger members of the old firm carried on the business until their death, in 1871 and 1873, leaving the business to be managed by their sons (the third generation), Franklin L. Tileston and Amor L. Hollingsworth. When first established, T. & H. hired a small mill in Dorchester. In 1809, they bought the mill prop-

erty belonging to the estate of Hugh McLean, on the Neponset River. In 1817, they further increased their business, by converting the chocolate-mill (near their first purchase) into a paper-mill; in 1828, they bought the mill known as the Fuller Mill; in 1836, they bought the Sumner Mills (now in the town of Hyde Park), and erected a paper-mill, — now called the Mattapan Mills; in 1863, they bought the mill property known as the Dorchester Cotton and Iron Co., and erected a large brick paper-mill, known as the Eagle Mill. Messrs. T. & H. were the first to introduce the Fourdrinier machine, and for many years were the only manufacturers of steel-plate papers, and the first to manufacture chromo-lithograph paper. The firm now make a specialty of plate, chromo, and lithograph paper. They also manufacture book, colored, chart, Bible, and fine-tinted papers for wood-cut printing. Messrs. Rice, Kendall, & Co. have been the selling agents of these papers in Boston for many years; Campbell, Hall, & Co., in New York; J. G. Ditman & Co., in Philadelphia; Dobler, Mudge, & Chapman, in Baltimore; Chatfield & Woods, in Cincinnati; and Clark, Friend, Fox, & Co., in Chicago.

The Boston office of the firm is at 47 Franklin Street.

JOHN BROMLEY & SONS, PHILADELPHIA, PA.**A W A R D.****PRODUCT: Carpets.**

A good exhibit of super and extra-super ingrain and damask Venetian carpets, tastefully designed, and unexceptionable in fabrication.

J U D G E S.

JOHN L. HAYES.
 ELLIOT C. COWDIN.
 CHARLES LE BOUTILLIER.
 CHARLES J. ELLIS.*
 J. D. LANG.
 Consul GUSTAV GEBHARD.
 THEODORE BOCHNER, Jr.
 HENRY MITCHELL.

Dr. MAX WEIGERT.
 LOUIS CHATEL.
 CARL ARNBERG.
 HAYAMI KENZO.
 JOHN G. NEESER.
 AUGUST BEHMER.
 ALBERT DANINOS.

C L A I M.

Our goods are not unknown in the market, and the claim made by us when the goods were placed on Exhibition at the International Exposition was fully sustained by the award of the judges, — a special point in our manufacture having always been to secure thorough *wearing* qualities. Our carpets were pronounced by the award to be “unexceptionable in fabrication.” In all other qualities of novelty of design, durability of color, and good taste and harmony of arrangement, we feel we are not second to any establishment in the country, and confidently ask the inspection of consumers.

* Signing Judge.

S. BACHMAN, NEW YORK, N. Y.**A W A R D.****PRODUCT: Shawls.**

An excellent display of silk and worsted plaid and reversible woollen velvet shawls, of novel and beautiful designs and excellent fabrication.

J U D G E S.

JOHN L. HAYES.
ELLIOT C. COWDIN.
CHARLES LE BOUTILLIER.
CHARLES J. ELLIS.
J. D. LANG.
CONSUL GUSTAV GEBHARD.
THEODORE BOCHNER, Jr.
HENRY MITCHELL.

Dr. MAX WEIGERT.*
LOUIS CHATEL.
CARL ARNBERG.
HAYAMI KENZO.
JOHN G. NEESER.
AUGUST BEHMER.
ALBERT DANINOS.

The goods shown by me at the Exposition, on which the above award was granted, were from stock made in 1875.

Those of the same class now coming from the mill show an improvement of at least 50 per cent; and these now are, in every respect of quality, style, and price, the superior of any imported.

In reversible velvet shawls, and other goods of like character, we were the first manufacturers in this country to produce them.

I claim for my goods originality and beauty of designs, superior quality and finish, excellence in fabrication, and lower prices than those of any other make of like quality here or abroad.

* Signing Judge.

THE ROCK MANUFACTURING CO., ROCKVILLE, CONN.**A W A R D.****PRODUCT: Fancy Cassimeres.**

An unsurpassed exhibit of fancy cassimeres, in great variety of designs, without blemish in texture and finish; the hair-lines and velvets especially commendable.

J U D G E S.

JOHN L. HAYES.
ELLIOT C. COWDIN.
CHARLES LE BOUTILLIER.
CHARLES J. ELLIS.*
J. D. LANG.
CONSUL GUSTAV GEBHARD.
THEODORE BOCHNER, Jr.
HENRY MITCHELL.

Dr. MAX WEIGERT.
LOUIS CHATEL.
CARL ARNBERG.
HAYAMI KENZO.
JOHN G. NEESER.
AUGUST BEHMER.
ALBERT DANINOS.

C L A I M.

The Rock Manufacturing Company, of Rockville, Conn., was chartered by the General Assembly of the State of Connecticut, May 7, 1828, upon memorial of Francis McLean, George Kellogg, Ralph Talcott, and Aaron Kellogg, of the town of Vernon; and organized Dec. 31, 1828, with George Kellogg as Treasurer and Francis McLean as President.

Mr. Kellogg was connected with the company, either as its Agent or Treasurer, from its organization to the date of his decease in August, 1870, with the exception of the years 1843, 1844, and 1845, and to his sterling integrity and rare business qualification is due in great measure the prosperity of the company. Mr. S. D. W. Harris, who had been Superintendent of the company, was elected Agent and Treasurer after the decease of Mr. Kellogg. Mr. Harris added much to the reputation of the company by his careful administration of its affairs; retiring in 1873, when Mr. Crosley Fitton, who had been Superintendent, was

* Signing Judge.

elected the company's Agent. Mr. Fitton brought to the company a practical knowledge of manufacturing acquired by a life service, the benefit of which to this mill can only be seen by comparing the product of to-day with that of 1867.

From one set of crude machinery in 1828, on cheap satinets, this company has grown to twenty sets on fine cassimeres in 1876; and from one building 20 feet by 10 in 1828, to twelve in 1876, three of which are supplied with water-power. That the goods produced by this mill have been well looked after in the market, it is only necessary to mention such firms as Joseph Lea & Co., of Philadelphia, W. W. Huntington & Co., Thomas & Co., and Pomeroy & Plummer, of New York, as having been at different times their selling agents, — the latter firm having been the sole agents since July 1, 1871.

On the board of direction have been such names as Austin Dunham and E. N. Kellogg, of Hartford, gentlemen of wide business experience, and whose counsel has been invaluable to the success of the company, — Mr. Dunham having been a director since 1846.

This company, in connection with the Hockanum Company, of Rockville, Conn., exhibited at Vienna, in 1873, in the name of their agents, Messrs. Pomeroy & Plummer, of New York; and were awarded the highest medal of their class, — the "Medal of Progress."

While we do not claim superiority over all other manufacturers, we do claim to make a fine cassimere, of texture and finish second to none in the market, and refer you to the consumers and the report of the Bureau of Awards, United States Centennial Commission, to substantiate our claim.

The goods may be seen at the store of Messrs. Pomeroy & Plummer, and 61 63 Leonard Street, New York.

ROCK MANUFACTURING COMPANY,

T. M. DURFEE, Treasurer.

WHITTENTON MANUFACTURING CO., TAUNTON, MASS.

A W A R D.

PRODUCT: Cottonades, Dress Goods, &c.

Commended for superior excellence in quality and design, good combination of colors, and great variety. Twilled mixed cottonades, excellently colored and harmonized; fancy cotton cassimeres, patterns choice in designs, of great strength and general good quality; dress goods, mauve colors, well designed and durable.

J U D G E S.

EDWARD ATKINSON.
HUGH WADDELL, Jr.
ED. RICHARDSON.
A. D. LOCKWOOD.
CHARLES H. WOLFF.
SAMUEL WEBBER.
GEORGE O. BAKER.

ISAAC WATTS.
W. W. HULSE.
DON ALVARO DE LA GANDARA.
ARNOLD GOLDY.
GUSTAV HERRMANN.
JOSEPH DASSI.

C L A I M.

The Mills of the Whittenton Manufacturing Company are located in Taunton, Massachusetts. The owners and managers are the three brothers, Charles L., William C., and Henry M. Lovering. Whittenton Village is one of the pleasantest and most populous of the numerous settlements that make up the city of Taunton. The site of the mills has been occupied for nearly two hundred years by some branch of manufacturing. Iron-works were established here as early as 1680; and, in 1829, a cotton-mill was built for the manufacture of print cloths. It was under the management of Mr. Willard Lovering, the father of the present owners, that the Whittenton Mills, in 1836, began to develop successfully; and, in 1851, Mr. Lovering began the manufacture of colored cotton fabrics, necessitating the addition of a dye-house and almost entirely new machinery. Beginning in a small way, with only about 5,000 spindles and 100 looms, the mills have gone on increasing, with almost unvarying success, until the present time, when they are running 25,000 spindles and 750 looms. Embraced in the great variety of the products of this company are cottonades, dress goods, shirtings, chevots, tickings, denims, cotton flannels, and nankins. It has always been the highest ambition of the Messrs. Lovering that their goods should excel in style and manufacture; and to this end they have spared neither expense nor endeavor. How successful they have been is amply testified by the wide and eminent reputation the Whittenton goods have in the market, as also by the award of the Centennial Commission at the recent Exposition. The Whittenton manufactures are sold by Messrs. Faulkner, Page, & Company, 66 and 68 Franklin Street, Boston, and 66 and 68 Leonard Street, New York.

C. W. & J. PEIRCE, BRISTOL, PA.**A W A R D.****PRODUCT: Felts, Crumb-Cloths, and Felt Skirts.**

A capital display of felts for carpetings, skirts, and other purposes, made of all-wool, and cotton and wool; the fabrication substantial and excellent, the designs of the carpetings and crumb-cloths remarkable for originality and beauty.

J U D G E S.

JOHN L. HAYES.
ELLIOT C. COWDIN.
CHARLES LE BOUTILLIER.
CHARLES J. ELLIS.*
J. D. LANG.
CONSUL GUSTAV GEBHARD.
THEODORE BOCHNER, JR.
HENRY MITCHELL.

DR. MAX WEIGERT.
LOUIS CHATEL.
CARL ARNBERG.
HAYAMI KENZO.
JOHN G. NEESER.
AUGUST BEHMER.
ALBERT DANINOS.

C L A I M.

**C. W. & J. PEIRCE, Manufacturers of Felt Goods, Livingston Mills,
Bristol, Pa.**

We claim for our goods that they are made entirely of pure stock, being free from shoddy or other material of which the life has been destroyed; that they are made with cross fibre, and consequently of equal strength both ways, which is the case with but very few others; that our colors are of recognized superiority, both in brilliancy and durability.

While we are compelled to produce goods partially of cotton to meet the demand for low prices, we always urge the advantage of buying all-wool goods; as cotton contains no felting property, and any admixture of it materially deteriorates the quality of the fabric.

* Signing Judge.

JOHN D. CUTTER & COMPANY, PATERSON, N. J.**A W A R D.****PRODUCT: Sewing Silk and Silk Machinery.**

Black and colored sewing silks and machine twist, excellent in every respect, and particularly distinguished for the great regularity obtained through their new system of grading the sizes. The machinery exhibited for the purpose of spooling and measuring the silk is of ingenious construction and good workmanship.

J U D G E S.**JOHN L. HAYES.****ELLIOT C. COWDIN.****CHARLES LE BOUTILLIER.****CHARLES J. ELLIS.****J. D. LANG.****CONSUL GUSTAV GEBHARD.*****THEODORE BOCHNER, Jr.****HENRY MITCHELL.****Dr. MAX WEIGERT.****LOUIS CHATEL.****CARL ARNBERG.****HAYAMI KENZO.****JOHN G. NEESER.****AUGUST BEHMER.****ALBERT DANINOS.**

C L A I M.

We claim to have reduced to systematic methods many of the little processes of manufacture generally left to the judgment or caprice of the workmen, or to chance. From these and other improvements, we produce a thread more exact in size, uniform in twist and strength, and put up in more correct and reliable lengths, on a spool, than those of any other manufactory. We also are now making perfectly pure dress silks, serges, &c.

It is our ambition and purpose to produce honest goods in all particulars of weight, strength, uniformity, and color; and in these essentials we challenge competition.

We have recently purchased, and moved into, the largest sewing-silk factory in the United States, at Newark, New Jersey, where we have every facility for the manufacture of black and colored sewing silks and machine twist, tram, organzine, fringe, &c.

* Signing Judge.

JOHN & JAMES DOBSON, PHILADELPHIA, PA.**A W A R D.****PRODUCT:** Carpets, Blankets, and Overcoatings.

A varied exhibit of carpetings, all attractive in design, and desirable as low and medium grades at moderate prices; also, blankets, all-wool fur beavers, and chinchillas, adapted for the masses.

J U D G E S.

JOHN L. HAYES.
 ELLIOT C. COWDIN.
 CHARLES LE BOUTILLIER.
 CHARLES J. ELLIS.*
 J. D. LANG.
 Consul GUSTAV GEBHARD.
 THEODORE BOCHNER, Jr.
 HENRY MITCHELL.

Dr. MAX WEIGERT.
 LOUIS CHATEL.
 CARL ARNBERG.
 HAYAMI KENZO.
 JOHN G. NEESER.
 AUGUST BEHMER.
 ALBERT DANINOS.

C L A I M.**FALLS OF SCHUYLKILL BLANKET, CLOTH, AND CARPET MILLS.**

These mills are situated in the city of Philadelphia, and owned by Messrs. JOHN and JAMES DOBSON, who give their personal attention to every detail and all the *minutiæ*, both in running the same and manufacturing the goods.

They are the largest and most complete individual mills in the country; not being owned by a corporation, but simply their individual property.

There are employed, in the various departments, between two and three thousand hands. Experts, and skilled labor of great experience, are to be met with in the various departments. The consumption of wool exceeds six million pounds annually, in the production of their goods. The Jury of Award at the Centennial Exhibition admired their exhibit very much, for its abundant variety.

* Signing Judge.

The report of the Centennial Commission was most favorable; and the Messrs. DOBSON were rewarded by receiving the highest merit of a diploma, with a Grand Medal of Honor.

The blankets of the above mills are sold by —

Messrs. WILSON & BRADBURY,

217 Chestnut Street, Philadelphia;

the cloths by —

Messrs. KEYSER, TOWNSEND, & Co.,

North Street, New York;

whilst the carpets are disposed of at their own store (wholesale and retail), 809 and 811 Chestnut Street, Philadelphia.

BALLARD VALE MILLS, BALLARD VALE, MASS.**AWARD.****PRODUCT: Flannels.**

An exhibit of all-wool flannels from No. 1 to 5, including extra and double extra, all highly meritorious. The $\frac{1}{2}$ silk warp, wool filling, and $\frac{1}{4}$ silk warp gauze especially commendable for perfection of fabrication.

JUDGES.

JOHN L. HAYES.*
 ELLIOT C. COWDIN.
 CHAS. LE BOUTILLIER.
 CHAS. J. ELLIS.
 J. D. LANG.
 CONSUL GUSTAV GEBHARD.
 THEODORE BOCHNER, JR.
 HENRY MITCHELL.

DR. MAX WEIGERT.
 LOUIS CHATEL.
 CARL ARNBERG.
 HAYAMI KENZO.
 JOHN G. NEESER.
 AUGUST BEHMER.
 ALBERT DANINOS.

CLAIM.

The Ballard Vale Company was incorporated by an act of the Legislature of Massachusetts, in January, 1836. The introduction of double spinning into the country dates from this time. The first piece of fine white flannel manufactured in the United States was made in 1836, by the Ballard Vale Company, under the management of John Marland, Treasurer and Agent.

In 1838, the original building was enlarged, and the capacity of the mill increased.

In 1842, Charles Barnes, of North Andover, went to England to purchase worsted machinery. The following year, the first piece of worsted goods made in the United States was manufactured at this mill. In this year, the capacity of the mill was largely increased by the addition of a second building, designed to be used exclusively for the manufacture of worsted goods.

The business of manufacturing worsted goods, in connection with the making of fine flannels, was conducted by the Ballard Vale Company from 1843 to 1850, when the worsted mill was leased to Jeremiah S. Young, under whose management it remained until 1853, when this

* Signing Judge.

branch of the business, and much of the skilled help, were transferred by him to the Pacific Mills, at Lawrence.

The manufacture of fine flannels was continued by the company up to the year 1866, at which time the Ballard Vale Company as a corporation ceased to exist. From that to the present time the business has been conducted as a private enterprise.

Among the goods displayed at the Centennial Exhibition at Philadelphia, were —

Five Pieces of All-Wool White Flannel, 4-4 Extra and Double Extra.

1 piece	140 picks to the inch ;	Warp, 81,000 ;	Filling, 40,000 yds. to the pound.
1 do.	135 " " "	81,000 ;	" 40,000 " "
2 do.	130 " " "	81,000 ;	" 40,000 " "
1 do.	128 " " "	81,000 ;	" 40,000 " "

Average weight of cloth $3\frac{1}{4}$ ozs. to the yard.

Two Pieces 4-4 Extra.

1 piece	125 picks to the inch ;	Warp, 28,000 ;	Filling, 81,000 yds. to the pound.
1 do.	120 " " "	28,000 ;	" 81,000 " "

Average weight of cloth, $3\frac{1}{4}$ ozs. to the yard.

Two Pieces 4-4 Silk Warp Gauze,

52 picks to the inch ; Filling, 44,000 yards to the pound. Cloth weighed $1\frac{1}{2}$ oz. to the yard.

Two pieces 4-4 Wool Gauze,

50 picks to the inch ; Warp, 32,000 ; Filling, 44,000 yards to the pound. Cloth weighed 2 ozs. to the yard.

One Piece 4-4 Silk Warp, Extra,

135 picks to the inch ; Filling, 40,000 yards to the pound. Cloth weighed $3\frac{1}{4}$ ozs. to the yard.

In addition to the above mentioned, there was shown a line of azures, zephyrs, India cloth, chinchillas, Japanese, and a full assortment of the regular goods, of all widths and qualities from No. 1 to 5.

AWARD OF THE UNITED STATES CENTENNIAL COMMISSION.

"For exhibit of All-Wool Flannels from No. 1 to 5, including Extra and Double Extra, all highly meritorious.

"The 4-4 Silk Warp Wool Filling, and 4-4 Silk Warp Gauze, specially commendable for perfection of fabrication."

JAMES SHAW, Manufacturer,

J. PUTNAM BRADLEE, Proprietor.

NORTH STAR MILLS, MINNEAPOLIS, MINN.

A W A R D .

PRODUCT: Blankets.

Commended for blankets made of Minnesota and Ohio wools, of very high excellence and beauty; also, for blankets sixty-six by eighty-four inches, adapted for popular consumption, at low price.

J U D G E S .

JOHN L. HAYES.*
 ELLIOT C. COWDIN.
 CHARLES LE BOUTILLIER.
 CHARLES J. ELLIS.
 J. D. LANG.
 CONSUL GUSTAV GEBHARD.
 THEODORE BOCHNER, Jr.
 HENRY MITCHELL.

Dr. MAX WEIGERT.
 LOUIS CHATEL.
 CARL ARNBERG.
 HAYAMI KENZO.
 JOHN G. NEESER.
 AUGUST BEHMER.
 ALBERT DANINOS.

C L A I M .

The North Star Woollen Mill, of Minneapolis, Minn., built in 1864, was not employed exclusively in the manufacture of blankets until 1869. The wools of the North-west were found to be especially adapted to the production of soft, clear blankets; while the water and atmosphere of Minnesota formed brilliant colors. The first blankets shipped to New York in 1870, attracted much attention, and elicited the highest praise from the leading retail houses. Since that time, the North Star blankets have gained a world-wide reputation, and have contributed much toward establishing the superiority of this class of American fabrics. The production of this mill not only includes white blankets, but carriage robes and travelling blankets executed in the richest and most elegant designs; also, Pullman-car blankets, and many styles of camping blankets especially adapted to the wants of surveyors and miners. The trade-mark consists of a five-pointed star, surrounded by the letters N O R T H ; and is a guarantee that the goods upon which it is placed are all-wool, in the most complete sense of the word, and are entirely free from reworked stock. The display of North Star blankets at the Centennial Exposition attracted universal attention, and was a source of pride to the people of the North-west. The judges awarded a diploma and medal for this display of blankets, on the basis of their "very high excellence and beauty." The selling agents at the East are W. L. Strong & Company, New York.

* Signing Judge.

LOUIS FRANKE, NEW YORK, N. Y.

A W A R D .

PRODUCT: Silk Fringes and Braids.

Silk fringes, dress trimmings, and tassels made of the best material, excellent in style and manufacture.

J U D G E S .

JOHN L. HAYES.
ELLIOT C. COWDIN.*
CHARLES LE BOUTILLIER.
CHARLES J. ELLIS.
J. D. LANG.
CONSUL GUSTAV GEBHARD.
THEODORE BOCHNER, JR.
HENRY MITCHELL.

DR. MAX WEIGERT.
LOUIS CHATEL.
CARL ARNBERG.
HAYAMI KENZO.
JOHN G. NEESER.
AUGUST BEHMER.
ALBERT DANINOS.

C L A I M .

The firm of Louis Franke has been, for a number of years, the leading manufacturer of ladies' dress and cloak trimmings, consisting of fingers, marabouts, galloons, cords, braids, tassels, drops, and many other kinds of *passementerie* work. It is the aim of this house to procure the finest styles and latest fashions, and have all the goods made of the best quality of material, — to use the most skilful labor, and have them executed with the greatest care; and it was for these merits that the diploma and medal was awarded to this firm at the late Philadelphia Exhibition. Nearly six lofts full of machinery and about 80 hands find steady employment in the trimming factory at 489 Broadway and 444 Broome Street; and since January, 1876, another factory, employing about 100 hands, has been in operation in Paterson, N. J., for the purpose of throwing the raw silk into the various sizes used in the manufacture of trimmings; also, for braiding moulds, cords, braids, for the same purpose. This factory in Paterson is considered one of the first of its class.

In the course of the fifteen years' existence of this firm, many specialties have been introduced by them into this country: for instance, the well-known Angora-goat hair fringes and tassels, in great variety, which found an unparalleled sale all over the country; also, the crimped tape or braid fringes, in numerous styles, which have also found such a warm reception and ready sale. This crimped braid fringe, if made of the best material, is the best wearing fringe known, especially that made of the very narrow braid. It had given such satisfaction that Messrs. A. T. Stewart & Co., and several other large importers, had sent samples to Paris and Germany to have them copied, to give them the same appearance; and yet, when they came, were far inferior both in quality and appearance.

* Signing Judge.

PONTOOSUC WOOLLEN MANUFACTURING COMPANY, PITTSFIELD, MASS.

A W A R D .

PRODUCT: Robes and Blankets.

An excellent exhibit of lap and railway robes, all made of California wool. The Pullman-Palace and Wagner's blankets all particularly noteworthy.

J U D G E S .

JOHN L. HAYES.
ELLIOT C. COWDIN.
CHARLES LE BOUTILLIER.
CHARLES J. ELLIS.*
J. D. LANG.
CONSUL GUSTAV GEBHARD.
THEODORE BOCHNER, Jr.
HENRY MITCHELL.

DR. MAX WEIGERT.
LOUIS CHATEL.
CARL ARNBERG.
HAYAMI KENZO.
JOHN G. NEESER.
AUGUST BEHMER.
ALBERT DANINOS.

C L A I M .

The finest exhibition of carriage-lap blankets at the Centennial was undoubtedly that made by the Pontoosuc Woollen Company, of Pittsfield, Mass., which was the pioneer in introducing this manufacture into the United States. The designs shown by the company in this class of goods were extremely tasteful, and the colors rich. The same company also showed a fine line and a great variety of rugs, sleeping-car blankets, cassimeres, dress goods, and repellants. The latter were especially admirable, and were in a large variety of styles and qualities. The whole display did the highest credit to American taste and skill.

The Pontoosuc Woollen Mill was one of the first outgrowths of the tariff of 1824, which was advocated by Henry Clay as the foundation of his "American system." Hon. Henry Shaw, of Lanesborough, then member of Congress from Berkshire, and an ardent supporter of the tariff; David Campbell; Thaddeus Clapp; and George W. Campbell, of Pittsfield, — were the first members of the company; which was formed in 1825, incorporated in 1826, and formally organized under its charter in 1828.

The site selected for the factory was on the outlet of a beautiful lake, which thenceforward took the name of Pontoosuc from that of the factory, which in turn had been derived from the Indian appellation of the site of Pittsfield. This outlet afforded a fine water privilege; which, in 1866, was greatly improved by the erection of a massive dam, which

* Signing Judge.

increased the size of the lake, rendering it an almost inexhaustible reservoir. The factory was commenced in 1825; but such was the scarcity of skilled mechanics at that time, and so great the difficulty of procuring desired machinery promptly, that it was not ready to go into operation until the spring of 1827, when it began making plain broad-cloths and cassimeres. The Committee on Manufactures at the next cattle-show of the Berkshire Agricultural Society pronounced these goods "not to be excelled by any cloths imported from Great Britain." The company, however, were not so easily satisfied; and, in a communication to "Niles's Register" of 1829, they specially complained of the difficulty of procuring fine wool. Accompanying the communication was a present of extra-superfine cloth, showing the degree of perfection reached by the company; but they say that, out of 50,000 pounds of wool, they could select but 70 suitable for such a fabric. The increase in the production of the fine-wool sheep of Saxony soon remedied this difficulty, to a great extent.

Foreign competition, even under the various tariffs, was complained of. This was not entirely due to the lack of protection from government. Notwithstanding the great improvements which had been made, the American woollen manufacturers were still inferior in skill to their transatlantic rivals. There was trouble in obtaining fast colors; but another difficulty more affected the profits of the manufacturer. The makers of broadcloth, especially, were ambitious to make their fabrics as firm and heavy as the best imported goods; and the Pontoosuc Company, by dint of crowding into the weaving an unstinted amount of material, and removing the surplus in the process of dressing, accomplished this purpose, but with an enormous waste of stock. The foreign manufacturers had a knack and mystery in this particular which the American were long in acquiring, and, indeed, did not do so until they had learned the wisdom of concentration of effort upon special products. Colonel Thaddeus Clapp, who became superintendent of the Pontoosuc Mill upon its erection, had had many years' experience; but it was several more before he was satisfied with his own skill. The Pontoosuc goods, however, early obtained a reputation, which has constantly increased; and when, in 1834, they began to manufacture drab carriage cloth, the demand for it soon became so great that it occupied the mill almost exclusively until 1860. In that year, the fashionable rage for the Balmoral style of ladies' skirts offered the company an opening, which it seized upon with characteristic enterprise, making them a specialty, and not only devoting all their machinery to this product, but filling neighboring buildings with hand-loom for the same purpose. It was in the manufacture of this class of goods that the company first began to acquire its reputation for brilliant colors and tasteful patterns: the first being from designs collected in Canada by Mr. Thaddeus Clapp, the son and successor of the first superintendent, and which he was able to reproduce so as to rival the originals.*

* In 1865, the mill turned out, besides blankets and some minor products, 100,700.

When the Balmoral fashion began to pass away, in 1868, the company turned its attention to carriage-lap blankets, making the first ever issued from American looms. The first of these, also, was in imitation of an English specimen obtained by Mr. Clapp; and again the imitation soon equalled the copy in splendor of color and beauty of design. In six years, 322 different patterns were sent out from the Pontoosuc looms.

Their enterprise was liberally rewarded: and it led to the introduction of the manufacture of the sleeping-car blanket, with which they now supply the Pullman and Wagner Car Companies, besides many leading railroads. In addition to the above products, the company is now making repellants and blue flannel. As originally built, the factory, which is of brick, was 145 feet long by 50 wide, and four stories high; but, in the summer of 1876, a large addition was made to it. In the same season, a new and powerful wheel was put in. During the present year, two additional sets of cards and thirty broad looms have also been put in. The machinery now comprises twelve sets of cards and ninety broad looms, and employs from 200 to 250 hands. California wool is used exclusively; and the consumption in 1877 will reach over 800,000 pounds.

The officers of the company in 1877 are—President, Ensign H. Kellogg; General Agent and Superintendent, Thaddeus Clapp; Clerk, Treasurer, and Assistant Superintendent, J. Dwight Francis.

The goods manufactured at the Pontoosuc Mill, in the half-century of its existence, have often been varied to suit the changeful moods of the market; but the skill of its managers since the very earliest years has been such as to meet all the emergencies. Indeed, many of the fabrics are of a class in regard to which the market is most fickle; and it has been the pride of the company to meet its phases promptly and profitably, and still maintain the high character of its goods.

Such is the history of one of the most enterprising concerns of which the United States can boast; and which, in its rise and progress, the skill it exhibits in its manufactures, and the high reputation which it has acquired of making first-quality goods, is an honor to the country. During its long and prosperous business career, it has sold its goods in every trade-centre of the country; and they have gone into thousands of homes, missionaries for the expulsion of foreign goods, which they have had a large share in accomplishing. The judges at the Centennial were highly pleased with their display, and awarded it the first prize, besides making special mention of its merits in their report.

LYMAN MILLS, HOLYOKE, MASS.**A W A R D.****PRODUCT: Cotton Fabrics.**

Commended for excellence in the manufacture of Victoria lawns, twilled cambrics, and cords.

J U D G E S.

EDWARD ATKINSON.
HUGH WADDELL, Jr.
ED. RICHARDSON.
A. D. LOCKWOOD.
CHARLES H. WOLFF.
SAMUEL WEBBER.
GEORGE O. BAKER.

ISAAC WATTS.
W. W. HULSE.
DON ALVARO DE LA GANDARA.
ARNOLD GOLDY.
GUSTAV HERRMANN.
JOSEPH DASSI.

C L A I M.

The Lyman Mills are situated on the Connecticut River, in Holyoke, Mass. The corporation has three large mills, 68 + 270 feet, with storehouses, machine shop, and tenements sufficient to accommodate all their overseers and operatives.

Mill No. 1 was built by the Hadley Falls Company, in 1849; and contains 23,000 spindles, and manufactures cotton cloths from yarns Nos. 14 to 20, with 626 looms. The product consists of drillings, heavy and light sheetings, and flannels. Weekly production from 50,000 to 55,000 pounds, and consumption of cotton 140 bales. Many of these goods are sold for export.

Mill No. 2 was built in 1851, expressly for fine yarns, Nos. 50 to 90, and has at the present time 52,000 spindles. In 1873, the third mill was built as an auxiliary to No. 2, and weaves all the yarn produced in the latter. It contains 928 looms, has all the machinery requisite for warping, spooling, and dressing for the same, and produces weekly 125,000 yards of cloth, consisting of lawns, cambrics, umbrella cloths, fine shirtings, and twills.

The corporation owns 21½ mill-powers, equivalent to 1,400 horse-powers.

The capital is \$1,470,000, in shares of one hundred dollars each. The mills are heated by steam, and lighted by gas furnished by the Holyoke Water Power Company.

The annual consumption of cotton is 4,400,000 pounds; and production of cloth, 14,000,000 yards.

The corporation derives its name from George W. Lyman, Esq., who was elected as the first treasurer, and filled that office until January, 1868; when the present treasurer, Mr. S. L. Bush, was elected. Messrs. Minot, Hooper, & Company, Boston and New York, have acted as selling agents since 1857.

Mr. Thomas J. Allen has filled the office of clerk to the corporation from the date of its organization to the present time.

C. A. THUDIUM & SON, PHILADELPHIA, PA.

A W A R D.

PRODUCT: Knitted Cardigan Jackets.

The undersigned, having examined the product herein described, respectfully recommend the same to the United States Centennial Commission for award, for the following reasons, viz., Material used excellent in color and general finish.

J U D G E S.

B. F. BRITTON.*
M. P. EMPEY.
W. H. CHANDLER.
W. O. LINTHICUM.
KANITZ.

GEO. HEWSTON.
E. N. HORSFORD.
MODEST KITTARY.
Ch. F. DIETZ MONNIN.

The house of C. A. Thudium & Son was established by C. A. Thudium, in 1844, by importing hand-knit jackets from Germany; increasing the sales yearly, so that they became in universal demand from all parts of the country.

About 1863, Cardigan Jackets were first manufactured in this country, and found ready sales on account of their good merits in comfort, style, price, &c. Since then, the demand has steadily increased. In 1867, C. A. Thudium began getting up worsted yarns, in all colors, for knitting purposes; which, on account of their superiority, found ready sale, increasing continually, and are favorably known by the trade throughout the country.

In January, 1874, he admitted his son, Robert C., into partnership with him, and the name of the firm was changed to C. A. Thudium & Son. In June, 1874, C. A. Thudium died, leaving his interest in the business to his wife.

Their facilities have been extended as their business increased; until, at the present time, they employ a large number of hands in connection with machinery for the production of their goods, which are known throughout the trade on account of their superiority of styles and workmanship.

* Signing Judge.

J. H. HAYDEN & SON, WINDSOR LOCKS, CONN.**A W A R D.****PRODUCT : Sewing Silk.**

Slack and medium-twist sewing silk, of great brilliancy, strength, and regularity.

J U D G E S.

JOHN L. HAYES.
 ELLIOT C. COWDIN.
 CHARLES LE BOUTILLIER.
 CHARLES J. ELLIS.
 J. D. LANG.
 CONSUL GUSTAV GEBHARD.*
 THEODORE BOCHNER, Jr.
 HENRY MITCHELL.

Dr. MAX WEIGERT.
 LOUIS CHATEL.
 CARL ARNBERG.
 HAYAMI KENZO.
 JOHN G. NEEZER.
 AUGUST BEHMER.
 ALBERT DANINOS.

C L A I M.

Established 1838. J. H. Hayden & Son, late Haskell & Hayden, Windsor Locks, Conn.

We claim that our long experience and facilities enable us to produce a sewing silk unequalled for strength and regularity.

* Signing Judge.

JAMES PHILLIPS JR., FITCHBURG, MASS.

A W A R D.

PRODUCT: Worsted Suitings.

Worsted suitings made from Ohio wool, unsurpassed for excellence of manufacture, superiority of quality, and beauty of styles.

J U D G E S.

JOHN L. HAYES.*
ELLIOT C. COWDIN.
CHARLES LE BOUTILLIER.
CHARLES J. ELEIS.
J. D. LANG.
CONSUL GUSTAV GEBHARD.
THEODORE BOCHNER, Jr.
HENRY MITCHELL.

Dr. MAX WEIGERT.
LOUIS CHATEL.
CARL ARNBERG.
HAYAMI KENZO.
JOHN G. NEESER.
AUGUST BEHMER.
ALBERT DANINOS.

C L A I M.

This mill, located in Fitchburg, Mass., was started on worsted coatings and suitings in March, 1872; and has continued, without interruption, ever since on the same class of goods.

It can, with propriety, claim the leading place in this country for the class of fabrics manufactured; and the greatest care is exercised in the manufacturing and selection of material.

Only the very finest stock is used; and, beside the best work of our domestic spinners, yarns in large quantities have been used from England, Germany, and France.

Every loom has been run on orders for more than two years; and it has now become the settled policy of the mill to produce only such goods as are absolutely ordered by the jobbers.

When started, it had but twelve looms, and has gradually been enlarged; fifty-three are now constantly employed. The sales amounting to \$600,000, annually.

The body is of brick, 165 feet long by 35 feet wide, with a wooden L attached, which contains the finishing, sorting, coloring, and drying. The motive-power is furnished by an eighty-horse Putnam engine, and a wheel of forty-five horse capacity.

James Phillips, Jr., is the sole proprietor; and attends to the manufacturing in person, assisted by James Pearce.

Hunt, Catlin, & Valentine, New York, have always been, and are now, the sole selling agents.

* Signing Judge.

WHITING PAPER COMPANY, HOLYOKE, MASS.**A W A R D.****PRODUCT:** Ledger, Fancy, and Colored Writing Papers.

The ledger papers are of unusual length and strength of fibre, insuring toughness: they are strongly sized, and of even finish and good color. The colored and fancy-marked papers are of handsome colors, delicate tints, and tasteful designs and finish. The whole exhibit, in its fulness and variety, shows a thorough knowledge of the details appertaining to paper-making and the public wants of that character.

J U D G E S.

JAMES M. WILCOX.
C. O. CHAPIN.
WM. FAXON.
EDWARD CONLEY.

H. T. BRIAN.
Sir SIDNEY H. WATERLOW.*
G. W. SEITZ.

C L A I M.

The organization of the Whiting Paper Company was effected in February, 1865. The stockholders were only three in number; viz., L. L. Brown and Edwin F. Jenks, of Adams, and William Whiting, of Holyoke.

The desire of the company has ever been to manufacture every variety of the best qualities of paper.

Having the purest water for the purpose of washing the stock, and the most improved machinery, the task of making a fine quality of paper was made easy where care and attention were always present.

The company was so favored, that, in 1870, they commenced to build a mill with a capacity of six (6) tons per day; thus making the

* Signing Judge.

product ten (10) tons per day, or four tons in excess of the quantity made by any other firm.

When we remember that, in 1860, a product of one ton per day was considered a large production, the quantity above-named as the product of the Whiting Company can only be accounted for by the fact that their papers are generally sought by the public.

It is the only firm which has not shrunk from competition with foreign manufacturers; and it is a fact well known to the consumers of the finest grades of paper that their papers have almost entirely taken the place of the foreign makes, which were formerly sent here in large quantities.

This company was urged to make an exhibition of its papers at the Centennial Exposition in 1876, and, in accordance with the invitation, furnished over five hundred different kinds for competition.

A comparison was desired with all other makes, and especially with those sent from abroad. The Commissioners, much to the regret of the managers of the Whiting Company, declined to adopt the plan of saying which was the best of a certain article of manufacture; but, in their opinion, they were unqualified in their commendations of the texture, finish, and beauty of these papers.

HOCKANUM CO., ROCKVILLE, CONNECTICUT.**A W A R D.****PRODUCT: Fancy Cassimeres and Worsteds.**

A superb display of fancy cassimeres and worsted suitings, excellent in all respects.

J U D G E S.

JOHN L. HAYES.
 ELLIOT C. COWDIN.
 CHARLES LE BOUTILLIER.
 CHARLES J. ELLIS.*
 J. D. LANG.
 Consul GUSTAV GEBHARD.
 THEODORE BOCHNER, Jr.
 HENRY MITCHELL.

Dr. MAX WEIGERT.
 LOUIS CHATEL.
 CARL ARNBERG.
 HAYAMI KENZO.
 JOHN G. NEESER.
 AUGUST BEHMER.
 ALBERT DANINOS.

C L A I M.

Among the establishments situated in the town of Rockville, Conn., which, from the exceptionally high character of the woollen cloths there manufactured, has been called the Elbeuf of America, is the Hockanum Company.

The Hockanum Company was organized in 1836. They made satinets in a two-set mill till 1849; when a new mill, with six sets of cards, was built and run on satinets, till a fire destroyed it in 1854. The company at once rebuilt the mill, and continued the manufacture of satinets, with four sets of cards, till 1858. At this time a change in the management took place; new machinery was obtained, and the mill has since run on fancy cassimeres. Since 1858, there have been added six sets of cards, and machinery and buildings to correspond. The company have also a four-set mill, which is run on the same goods. It has been the aim of the managers to make the best goods

* Signing Judge.

that could be made, and in the latest and most desirable styles. For this object, the finest native and imported wools are used, without mixture of cotton or shoddy. The goods of this company received the highest medal awarded to any American woollen manufacturer at the Vienna World's Fair. The managers of this company claim they have contributed their share in giving to American woollen goods the high reputation and character that they have attained, and which was so well shown at the Centennial Exposition at Philadelphia.

This company was under the charge of Alonzo Bailey most of the time, to 1858 ; since that date, George Maxwell has had charge of the affairs of the company, assisted, in the manufacturing department, since 1866, by George Sykes.

Messrs. POMEROY & PLUMMER, Nos. 61 and 63 Leonard Street, New York, are Agents for the sale of the goods.

GEORGE MAXWELL, Agent.

GEORGE SYKES, Superintendent.

LANGDON MANUFACTURING CO., MANCHESTER, N. H.**A W A R D.****PRODUCT : Cotton.**

Commended for the very superior quality and for the purity of finish of their fine and extra-fine shirting.

J U D G E S.

EDWARD ATKINSON.
HUGH WADDELL, JR.
EDWARD RICHARDSON
A. D. LOCKWOOD.
CHARLES H. WOLFF.
SAMUEL WEBBER.
GEORGE O. BAKER.
ISAAC WATTS.

W. W. HULSE.
DON ALVARO DE LA GANDARA.
ARNOLD GOLDY.
GUSTAV HERRMANN.
JOSEPH DASSI.
MENI RODRIGUES DE VASCON-
CELLOS.

C L A I M.

The Langdon Manufacturing Company, at Manchester, N. H., was incorporated in 1857. In 1860-61, No. 1 Mill was built, with 15,000 spindles and 300 looms. In 1869-70, No. 2 Mill was built, with 18,000 spindles and 400 looms. The product of these mills consists of fine and medium shirtings. At the Vienna Exposition, the G. B. cottons received the medal of merit, and were commended for the evenness and strength of texture, and for excellence of manufacture. At our Centennial, the judges' award attests their very superior quality, and the purity of their finish.

In July, 1875, a few sample cases were sent to Manchester, England. Nearly 1,000 cases have since been exported. The new product of No. 1 Mill, styled "the '76 fine shirting," is already deservedly popular. The capital of the company is \$500,000.

Mr. WILLIAM AMORY is President of the Company; Mr. W. L. KILLEY, Manufacturing Agent at Manchester; Mr. WILLIAM AMORY, Jr., Treasurer; J. L. BREMER, Bro. & Co., Selling Agents, Boston and New York.

CABOT MANUFACTURING CO., BRUNSWICK, ME.**A W A R D.****PRODUCT: Cotton Fabrics.**

A uniform quality of bleached goods, well made for service and durability.

J U D G E S.

EDWARD ATKINSON.
 HUGH WADDELL, JR.
 EDWARD RICHARDSON.
 A. D. LOCKWOOD.
 CHARLES H. WOLFF.
 SAMUEL WEBBER.
 GEORGE O. BAKER.
 ISAAC WATTS.

W. W. HULSE.
 DON ALVARO DE LA GANDARA.
 ARNOLD GOLDY.
 GUSTAV HERRMANN.
 JOSEPH DASSI.
 MENI RODRIGUES DE VASCON-
 CELLOS.

C L A I M.

In 1809, the first cotton mill built in the State of Maine was erected on the site now occupied by the mill of the Cabot Manufacturing Company, in the town of Brunswick, on the Androscoggin River.

The present mill was completed and put in operation in 1868, making fine shirting and sheetings, for bleaching; the yarn spun averaging No. 33.

The mill contains 35,000 spindles, and 716 looms. The goods at once obtained a character in the market for excellence of manufacture and uniformity, and have maintained their popularity without interruption.

Capital, \$600,000.

Treasurer.

FRANCIS CABOT.

Agent and Superintendent.

BENJAMIN GREENE.

Selling Agents.

WHEELWRIGHT, ANDERSON, & Co., Boston and New York.

MIDNIGHT YARN COMPANY, PHILADELPHIA, PA.**A W A R D.****PRODUCT:** Germantown Wool and Woollen Knitting Yarns.

An exhibit of Germantown Wool and Knitting Yarns, adapted for crochet and hand-knitting, embroidery and hosiery, of brilliant colors and great variety of shades.

J U D G E S.

JOHN L. HAYES.
ELLIOT C. COWDIN.
CHARLES LE BOUTILLIER.
CHARLES J. ELLIS.*
J. D. LANG.
CONSUL GUSTAV GEBHARD.
THEODORE BOCHNER, Jr.
HENRY MITCHELL.

Dr. MAX WEIGERT.
LOUIS CHATEL.
CARL ARNBERG.
HAYAMI KENZO.
JOHN G. NEESER.
AUGUST BEHMER.
ALBERT DANINOS.

C L A I M.

Our business of manufacturing yarns was founded by Mr. J. T. Midnight, in the year 1856; commencing with one set of machinery, in a small mill in Milltown, Chester County, Pa. Business increasing, he soon was compelled to add more machinery, and, for want of room, had to remove into this city, and rent rooms at the old Globe Mills, at the corner of St. John Street and Girard Avenue. In the year 1866, he admitted as partner Mr. W. A. Fleck, who took charge of the books and financial affairs of the concern, under the firm name, Midnight & Fleck, — Mr. Midnight continuing to superintend manufacturing. In the year 1869, two more partners were admitted, — Mr. Fred Dutt and Mr. Jacob Metzger, who had been engaged in the manufacturing department for a number of years; and the firm styled Midnight, Fleck & Co. In the year 1871, Mr. Midnight, after a successful career, retired from business, and sold out all his rights and interest to his former partners, who associated themselves under the firm of Midnight Yarn Company, — W. A. Fleck having charge of the general management of the business, Fred. Dutt superintending dyeing, and Jacob Metzger spinning and manufacturing department. By this arrangement we are able to produce goods acknowledged by the trade as comparing favorably with any of the kind in the market, regarding the quality, evenness of thread, brilliancy and variety of colors, and smoothness of finish. We have our mill running through the year, and during the fall season have to engage additional force to supply the demand for our goods. We warrant full weight of all the goods we sell, and will not allow deviations from our standard qualities for the sake of competition.

* Signing Judge.

GIBB & CO., PHILADELPHIA, PA.

A W A R D.

PRODUCT: Carpets.

An exhibit of cotton warp and rag filling carpet of substantial manufacture, at fair prices, specially adapted for kitchen or common use.

J U D G E S.

JOHN L. HAYES.

ELLIOT C. COWDIN.

CHARLES LE BOUTILLIER.

CHARLES J. ELLIS.*

J. D. LANG.

CONSUL GUSTAV GEBHARD.

THEODORE BOCHNER, Jr.

HENRY MITCHELL.

Dr. MAX WEIGERT.

LOUIS CHATEL

CARL ARNBERG.

HAYAMI KENZO.

JOHN G. NEESER.

AUGUST BEHNER.

ALBERT DANINOS.

C L A I M.

We claim for our goods, as commending them to general use,—

Their great neatness of appearance.

The durability, and uniform wear of their material.

The low prices at which our goods are offered in the market; making them accessible to the masses, and appropriate for universal household use.

* Signing Judge.

PACIFIC SCOURING COMPANY, SAN FRANCISCO, CAL.**A W A R D.****PRODUCT: Wool.**

A fine specimen of beautiful cleansed wool, carefully assorted into different qualities ready for manufacturing purposes.

J U D G E S.**JOHN L. HAYES.****ELLIOT C. COWDIN.****CHARLES LE BOUTILLIER.****CHARLES J. ELLIS.****J. D. LANG.****CONSUL GUSTAV GEBHARD.****THEODORE BOCHNER, JR.****HENRY MITCHELL.*****DR. MAX WEIGERT.****LOUIS CHATEL.****CARL ARNBERG.****HAYAMI KENZO.****JOHN G. NEESER.****AUGUST BEHMER.****ALBERT DANINOS.****C L A I M.**

The Pacific Scouring Company, whom the Report on Awards by the judges at the International Exhibition, Philadelphia (here copied), refers to, are located at San Francisco, Cal.

It must be clear to every manufacturer, that the saving in freight alone of from 65 to 75 per cent of dirt and grease (average shrink of California grease wool) enables the Pacific Scouring Company to sell their product at a less price than it is possible for any manufacturer to produce clean wool. The Pacific Scouring Company have a further advantage of residence in California, and a thorough acquaintance with individual ownership of clips of wool whose grade and condition are best adapted to scour; which advantage over occasional visitors and buyers in California is very great. The wool, also, can be sorted much closer, and scoured much cleaner, before being compressed in California, than after being compressed and received in this State, to be sorted by Eastern manufacturers. To manufacturers, well graded and scoured wool is a great *desideratum*; as they can buy the grade and only the grade needed for a particular style of goods, and in quantities to suit.

E. N. KELLOGG, of Hartford, Conn., receives and sells the entire product of the Pacific Scouring Company wool, and solicits orders from all first-class manufacturers.

* Signing Judge.

SARATOGA VICTORY MANUFACTURING COMPANY, SARATOGA, N. Y.

A W A R D .

PRODUCT: Black and Colored Silesias.

Commended for strength and firmness of fabrics, smooth weaving and finish, good colors, delicacy in coloring A No. 1 throughout.

J U D G E S .

EDWARD ATKINSON.
HUGH WADDELL, Jr.
EDWARD RICHARDSON.
A. D. LOCKWOOD.
CHARLES H. WOLFF.
SAMUEL WEBBER.
GEORGE O. BAKER.

ISAAC WATTS.
W. W. HULSE.
DON ALVARO DE LA GANDARA.
ARNOLD GOLDY.
GUSTAV HERRMANN.
JOSEPH DASSI.

Saratoga Victory Manufacturing Company, Schuylerville, N. Y., incorporated, 1846, for the manufacturing of cotton goods. Capital, \$425,000.

President.

E. R. MUDGE.

Treasurer.

C. H. JOY.

Agent.

C. W. MAYHEW.

Selling Agents.

E. R. MUDGE, SAWYER, & Co., Boston, New York, and Philadelphia.

The original mill of 9,000 spindles was built in 1846, to make 4-4 sheetings; but, in the following year, a dye-house was added, and the production of the mill was changed to cloths to be finished, — as colored cambrics, umbrella cloths, and silesias. This business has been prosecuted from that to the present time with marked success. Additions to the mills and finishing works have been made from time to time, and the most approved machinery put in; and the company now operates two mills, containing nearly 35,000 spindles and a finishing department second to none in the country. The Victory silesias have been favorably known to the dry-goods and clothing trades for thirty years, and the award made by the judges at the Centennial Exhibition shows that the company has kept up with the times, and that the patient, untiring, and intelligent prosecution of a manufacturing industry in this country is sure of meeting its reward.

LEEDOM, SHAW, & STEWART, PHILADELPHIA, PA.**A W A R D .****PRODUCT: Carpets.**

A creditable exhibit of extra-super carpets and damask Venetians, of good designs, especially noticeable for low prices.

J U D G E S .

JOHN L. HAYES.
 ELLIOT C. COWDIN.
 CHARLES LE BOUTILLIER.
 CHARLES J. ELLIS.*
 J. D. LANG.
 CONSUL GUSTAV GEBHARD.
 THEODORE BOCHNER, Jr.
 HENRY MITCHELL.

Dr. MAX WEIGERT.
 LOUIS CHATEL.
 CARL ARNBERG.
 HAYAMI KENZO.
 JOHN G. NEESER.
 AUGUST BEHMER.
 ALBERT DANINOS.

C L A I M .

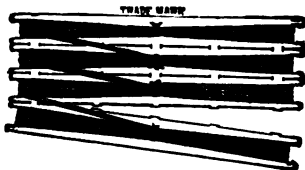
Thomas L. Leedom & Co., successors to Leedom, Shaw, & Stewart, claim for their manufactures weight of goods and quality of stock, colors, and style, using only the best dye-stuffs and yarns; will always sell at lowest market rates. For want of space, but two kinds of our goods were exhibited. We make several qualities equally meritorious: such as extra supers; union or cotton-chain extras, same styles and weight as extras; all-wool ingrains; double-cotton chains, all-wool fillings; double-cotton chains, wool figures; also, second quality, very heavy. Damask Venetians, halls and borders to match; also, fine Venetians; and also twilled and plain Venetians, all widths.

* Signing Judge.

SUTRO BROTHERS, NEW YORK, N. Y.**A W A R D.****PRODUCT: Silk and Cotton Braids.***For Braids of great regularity and excellent manufacture.***J U D G E S.**

JOHN L. HAYES.
 ELLIOT C. COWDIN.
 CHARLES LE BOUTILLIER.
 CHARLES J. ELLIS.
 J. D. LANG.
 CONSUL GUSTAV GEBHARD.
 THEODORE BOCHNER, Jr.
 HENRY MITCHELL.

Dr. MAX WEIGERT.
 LOUIS CHATEL.
 CARL ARNBERG.
 HAYAMI KENZO.
 JOHN G. NEESER.*
 AUGUST BEHMER.
 ALBERT DANINOS.

C U T S H O W I N G**EMBROIDERY BRAIDS,****Put up on Patent Cards.****Patented, Aug. 20, 1872. Reissued, Jan. 6, 1874, and Nov. 16, 1875.****The measurement is guaranteed on all goods put up on these cards.****SUTRO BROTHERS,****35 and 37 Wooster Street,****New York.***** Signing Judge.**

LOWELL BLEACHERY, LOWELL, MASS.**A W A R D.**

PRODUCT: Cotton Goods, as examples of Bleaching and Dyeing.
Commended for purity and whiteness, especially of the long-cloth finish.

J U D G E S.

EDWARD ATKINSON.
 HUGH WADDELL, Jr.
 EDWARD RICHARDSON.
 A. D. LOCKWOOD.
 CHARLES H. WOLFF.
 SAMUEL WEBBER.
 GEORGE O. BAKER.
 ISAAC WATTS.*

W. W. HULSE.
 DON ALVARO DE LA GANDARA.
 ARNOLD GOLDY.
 GUSTAV HERRMANN.
 JOSEPH DASSI.
 MENI RODRIGUES DE VASCON-
 CELLOS.

The Lowell Bleachery and Dye-Works was incorporated in 1833, for the purpose of bleaching, coloring, printing, and finishing cotton and woollen goods. From small beginnings, it has now reached a capacity to do 12,000,000 pounds bleaching, 18,000,000 yards fancy dyeing, 8,000,000 yards blue dyeing, per annum. The company owns a large property in Lowell, valued by the assessors at upwards of \$500,000. The buildings are of brick, with slated and gravel roofs. The works contain the newest and best machinery in all departments of bleaching, dyeing, and finishing, and are prepared to bleach, finish, and put into marketable condition sheetings, shirtings, drills, jeans, shoe ducks, flannels, and every description of cotton goods; and to dye cambrics, silesias, corset jeans, flannels, wigans, nankeens, hollands, lastings, &c.: and they have also works especially adapted for dyeing indigo-blue drills, &c., on a large scale. Sprinklers and hydrants are attached to all the rooms; and the company store goods, without charge, in large, fire-proof store-houses, so that owners of goods can effect insurance at a minimum rate. The company also own works which have recently been fitted up for printing and finishing cotton goods.

Mr. Charles T. Appleton was agent and treasurer, residing at Lowell, from 1833 to 1846, when he established the treasurer's office in Boston; and Mr. Charles A. Babcock became resident-agent at Lowell. In 1853, Mr. Babcock left, to become a partner in the house of Messrs. A. & A. Lawrence & Company; and Mr. F. P. Appleton, the present agent, succeeded him. Mr. Chas. T. Appleton, treasurer, died in March, 1859, when Mr. Samuel G. Snelling, the present treasurer, was appointed.

This establishment finishes goods for a number of the largest and best mills in New England.

The present principal officers are —

Hon. EMORY WASHBURN, President since July, 1864. (deceased.)

S. G. SNELLING, Treasurer, " March, 1859.

F. P. APPLETON, Agent, " Nov. 1853.

* Signing Judge.

C. POTTER, JR., & CO., NEW YORK, N. Y.**A W A R D.****PRODUCT: Stop-Cylinder Printing-Press.**

Designed and constructed with great care, and with special regard to strength where most needed; very perfect rolling and distribution, with a firm, strong, steady impression. This machine has a new movement called "trip at will," giving the operator absolute control over the machine, and preventing the spoiling of paper. The movement for automatically rolling the form three or four times for each impression is an advantage. The machine has many minor improvements, calculated to insure the production of illustrated works in the best style.

J U D G E S.

JAMES M. WILCOX.
C. O. CHAPIN.
WM. FAXON.
EDWARD CONLEY.

H. T. BRIAN.
Sir SYDNEY H. WATERLOW.*
G. W. SEITZ.

C L A I M.

Every practical printer who visited the late International Exhibition, and inspected the machines exhibited by C. Potter, Jr., & Co., in Machinery Hall, must have been impressed by their strength, harmonious proportions, finish, and perfect workmanship; for in all these respects they are without a rival. Their popularity has increased during the past year in an unprecedented degree; necessitating an enlargement of shops to more than double their former capacity, and the employment of every improvement in productive machinery, by which an increased demand can be promptly met. It is the aim of the manufacturers to produce the very best article human ingenuity can devise; and, to accomplish this, no effort or expense will be spared. All communications should be addressed to

C. POTTER, JR. & CO.,**12 and 14 Spruce Street, New York.**

* Signing Judge.

JAMES SMITH & CO., PHILADELPHIA, PA.**A W A R D.****PRODUCT: Machines and Card Clothing.**

A machine for washing wool, and a Garnett machine, both of excellent and simple construction and good workmanship; also, a very excellent exhibit of card clothing.

J U D G E S.

JOHN L. HAYES.

ELLIOT C. COWDIN.

CHARLES LE BOUTILLIER.

CHARLES J. ELLIOT.

J. D. LANG.

CONSUL GUSTAV GEBHARD.

THEODORE BOCHNER, Jr.*

HENRY MITCHELL.

Dr. MAX WEIGERT.

LOUIS CHATEL.

CARL ARNBERG.

HAYAMI KENZO.

JOHN G. NEESER.

AUGUST BEHMER.

ALBERT DANINOS.

C L A I M.

Messrs. James Smith & Co., one of the oldest and most experienced manufacturers of card clothing, were established in Leicester, in 1814, and removed to Philadelphia in 1830; where they have recently erected a new manufactory, located in the business centre of the city, on the north-east corner of Race and Crown Streets, above Fourth; and is the largest and most complete establishment of the kind in this country, being 55×170 feet, six stories high, well lighted on all sides, with an iron front on Race Street. They have a capacity for 500 card-setting machines, but are now running about 150, many of these machines are of their own construction; and the superiority of their production not only attests the perfection of their machinery, but the mechanical ability which they have at their command. They are also manufacturers of burring machinery, and all kinds of machinery for the preparation of stock for cotton and wool-working cards. This branch of their business is known as the Philadelphia Burring Machine Works. Their improved Garnett machine, or hard-waste card, also, their improved cotton or wool-washing machine, — are a most valuable acquisition to any manufacturer of cotton or woollen goods. Their store, 137 Market Street, is furnished with a most complete stock of manufacturers' supplies.

* Signing Judge.

STEAM WOOLLEN COMPANY, CATSKILL, N. Y.**AWARD.****PRODUCT: Cheviot Suitings and Shawls.**

A low grade of Cheviot suitings and cotton and wool shawls, both specially noteworthy for cheap prices and adaptation to general consumption.

JUDGES.

JOHN L. HAYES.
ELLIOT C. COWDIN.
CHARLES LE BOUTILLIER.
CHARLES J. ELLIS.*
J. D. LANG.
CONSUL GUSTAV GEBHARD.
THEODORE BOCHNER, Jr.
HENRY MITCHELL.

DR. MAX WEIGERT.
LOUIS CHATEL.
CARL ARNBERG.
HAYAMI KENZO.
JOHN G. NEESER.
AUGUST BEHMER.
ALBERT DANINOS.

CLAIM.

The Steam Woollen Company's mill was built by Samuel Harris, in 1864. It has ten sets of machinery, now running on shawls and 6-4 Cheviot suitings; in commendation of which, see award of the Centennial Commission herewith.

* Signing Judge.

MERIDEN WOOLLEN CO., WEST MERIDEN, CONN.**A W A R D.****PRODUCT: Fancy Union Cassimeres.***Fancy Union cassimeres, of good manufacture, at cheap prices.*

The exhibit of Union cassimeres made at the Exposition by this company was very creditable indeed, and richly deserved the notice taken of it and the award made by the committee.

No goods were manufactured by them especially for the Exhibition, but those displayed were taken from the regular stock : and the claim made before the judges was, that they were running a large mill on the same goods, producing them so that they could sell, and were selling them, at the prices named, without any loss ; and that for quality, finish, and styles they could not be excelled for the money. The award made by the judges was as follows : —

“ For fancy Union cassimeres, of good manufacture, at cheap prices.”

Signed,

CHAS. J. ELLIS, *Judge.**Approval of Group of Judges.*

HENRY MITCHELL.

CARL ARNBERG.

A. BEHMER.

JOHN D. LANG.

CHARLES LE BOUTILLIER.

JOHN G. NEESER.

T. BOCHNER, Jr.

ELLIOT C. COWDIN.

The facilities for manufacture are very extensive, the company having one of the finest mills in the country. The main building is 300 × 58, four stories high ; a large dye-house, wool-house, and other buildings, all of brick, and built in the most substantial manner.

The power is furnished by a 250-horse power Harris engine. The mill is furnished with the most thorough protection against fire. It has sprinklers throughout the buildings, supplied with water from a large steam pump, and also attached to the city reservoir, which has a pressure of 92 pounds to the square inch. The machinery consists of 13 sets of 48-inch cards, 100 broad Crompton looms, and other machinery for finishing, &c., all of the best makes. The present yearly production of the mill is 600,000 yards of 3-4 goods.

The mill was originally built, in 1865, by J. Wilcox & Co., for the manufacture of Balmoral skirts ; which business, at that time and for several years after, was very profitable ; but the company failed in 1873, and the property was purchased by the larger creditors, who organized the present company, the officers of which are as follows : —

Directors.

H. C. WILCOX, D. C. WILCOX, JOHN H. PEET, JAMES RENFREW, Jr.,
B. S. PRAY, W. M. HUMPHREY, O. B. ARNOLD.

President.

H. C. WILCOX.

Secretary and Treasurer.

E. I. MERRIMAN.

Agent and Superintendent.

WILLIAM DRYSDALE.

Selling Agents.

WHITTEMORE, PEET, POST, & Co., 316 Broadway, New York.

NORWAY PLAINS COMPANY, ROCHESTER, N. H.

A W A R D.

PRODUCT: Blankets.

Blankets of fine and medium grade, of excellent manufacture, at moderate prices, noticeable for cleanness of stock and freedom from grease.

J U D G E S.

JOHN L. HAYES.
ELLIOT C. COWDIN.
CHARLES LE BOUTILLIER.
CHARLES J. ELLIS.*
J. D. LANG.
Consul GUSTAV GEBHARD.
THEODORE BOCHNER, Jr.
HENRY MITCHELL.

Dr. MAX WEIGERT.
LOUIS CHATEL.
CARL ARNBERG.
HAYAMI KENZO.
JOHN G NEESER.
AUGUST BEHMER.
ALBERT DANINOS.

C L A I M.

The Norway Plains Company was chartered by the Legislature of New Hampshire in 1846, and in the following year took possession of the manufacturing property in Rochester, N. H., known as the Gonic Manufacturing Company, which was at the time owned and managed by Mr. John D. Sturtevant, and was making blankets.

This mill, before its purchase by Mr. Sturtevant, had been engaged in making blankets; and it was here that the manufacture of blankets for the general market was, it is believed, for the first time undertaken in this country, by the enterprise and capital of Mr. David S. Brown, of Philadelphia.

Mr. Sturtevant, becoming the principal stockholder in the Norway Plains Company, has remained its agent and chief manager up to the present time; and, during the intervening period of thirty years, the manufacture of blankets of all styles and qualities—bed blankets,

* Signing Judge.

Indian blankets, army blankets, horse blankets — has been continued without interruption.

The original old wooden buildings, containing about 10 sets of cards, have given place to three brick mills, with 26 sets of cards, thoroughly well provided with all needful appliances, with tenements, reservoirs, &c.

This long experience and devotion to the specialty of blankets has enabled them to take and to hold in the markets the position of the leading blanket mill in the United States.

In 1847, a gold medal was awarded to their blankets by the Massachusetts Mechanics' Institute, at their annual exhibition. In 1849, they received the first prize, a silver medal, at the exhibition of the Franklin Institute in Philadelphia. In 1852, a gold medal from the American Institute of New York was awarded to them. Their goods were so well known and appreciated in the leading markets of the country, that no subsequent displays were offered at fairs or exhibitions until the last year, at the great Centennial in Philadelphia.

LOBDELL CAR-WHEEL CO., WILMINGTON, DEL.

A W A R D .

PRODUCT: Paper-making Machinery.

This exhibit contains a stock of calendering rolls intended to be part of a complete paper-machine. These rolls are of cast-iron, chilled at the surface in casting, and thereby made hard like tempered steel. They are separately ground, according to a highly improved plan; and are so true that when placed together they bear upon each other throughout their entire length. This exhibit has the exceptional merit that the rolls are not only ground true, but cast, by the exhibitor.

J U D G E S .

JAMES M. WILCOX.*

C. O. CHAPIN.

WILLIAM FAXON.

EDWARD CONLEY.

H. T. BRIAN.

SIR SYDNEY H. WATERLOW.

G. W. SEITZ.

C L A I M .

Lobdell Car-Wheel Company, Wilmington, Del., established 1836. The manufacture of chilled iron calender rolls for paper machinery was commenced in this establishment in the year 1868. One of the first difficulties experienced was in small diameter rolls (which were largely used) in making the top neck or journal of soft or unchilled iron. This upper neck was liable to pull apart from the chilled body of the roll, necessitating a new neck to be burned on. To obviate this difficulty, many rolls were made with the upper neck cast in the chill, which necessitated additional expense in cutting out the journals. This difficulty was overcome by a process upon which letters-patent have been granted and secured to this establishment. The difficulties to be overcome in the successful casting of chilled rolls are manifold, and such as to deter many foundrymen from engaging in the business. In 1868, rolls were seldom made longer than 84 inches; the Lobdell Car-Wheel Company now cast, suc-

* Signing Judge.

cessfully, rolls 6 inches diameter and 100 inches long; of 7 inches diameter and 110 inches long; and from 8 inches to 24 inches diameter and 130 inches long on the face.

Very heavy and powerful machinery is required for turning the hard surface of a chilled roll; the process being a slow and tedious one, a large equipment of facing and necking lathes is required for a prompt execution of orders. This establishment has ample facilities to meet any demand that may be made upon it for rolls, either ground or turned ready for grinding, and is supplied with chills and fixtures for casting rolls from 5 inches to 24 inches diameter, and of any required length.

The grinding of chilled calender rolls is a work of great care and nicety: upon its accuracy depends the successful working of the calenders. So great accuracy should be and is obtained that a ray of light cannot be seen between the rolls, when they are placed one upon the other; and a human hair, placed equally distant from the two ends, would cause light to be seen at least 18 inches to 24 inches wide.

The particular claim made by this firm in their Centennial exhibit was, that, while their ability to finish and grind calender rolls was equal to any in the United States, without exception, their long experience in the manufacture of railroad wheels of over forty years; their personal attention to the details of selecting iron (every pound of which is sorted out by themselves); and their intimate knowledge and experience in making chilled castings, and the peculiar properties of chilling irons,— enabled them to make a calender roll possessing the requisite properties of toughness and extreme hardness: qualities necessary to insure the best results in such manufacture.

The first chilled iron calender roll sent to the United Kingdom was a sample roll from this establishment, sent some years ago; since which time, this trade forms an important part of the business of this and many other manufacturers in that line. The products of this establishment can be found throughout every country where chilled calenders have been adopted.

G. L. KELTY & CO., NEW YORK, N. Y.

A W A R D.

PRODUCT: Terry and Damasks for Upholstery Purposes.

Plain, figured, and striped terries and damasks, for upholstery use, substantially made, and of neat designs.

J U D G E S.

JOHN L. HAYES.*

ELLIOT C. COWDIN.

CHARLES LE BOUTILLIER.

CHARLES J. ELLIS.

J. D. LANG.

CONSUL GUSTAV GEBHARD.

THEODORE BOCHNER, Jr.

HENRY MITCHELL.

Dr. MAX WEIGERT.

LOUIS CHATEL.

CARL ARNBERG.

HAYAMI KENZO.

JOHN G. NEESER.

AUGUST BEHMER.

ALBERT DANINOS.

C L A I M.

Our goods were placed in the Exposition, not only for exhibition, but *competition*. All we claimed for them was admitted by the judges in their award, as above.

Extract from the report of Mr. Louis Chatel, the celebrated delegate of the French government:—

“The American section of weaving of fabrics for upholsterers’ use offers few specimens so perfect as those exhibited by Messrs. G. L. Kelty & Co., of New York. The weaving of the plain reps is extremely regular; their various colors are in very striking shades; the reversible striped fabrics (with several warps) are, unquestionably, as well manufactured as certain of our European articles; and the figured Jacquard stuffs are, generally, of rich but simple designs. On seeing the highly improved state which this manufacture has reached in this country, I can readily understand the competition which these gentlemen have caused to our French market, and how much our exportation must thereby suffer.”

* Signing Judge.

BYRON WESTON, DALTON, MASS.

A W A R D.

PRODUCT: Fine Paper.

This exhibit of pearl and white vellum and laid ledger and record papers is one of remarkable excellence. The colors are excellent, the assorting careful, the fibre long and tough, and the paper thoroughly sized. The finish is all that can be desired.

J U D G E S.

JAMES M. WILCOX.*
C. O. CHAPIN.
WM. FAXON.
EDWARD CONLEY.

H. T. BRIAN.
Sir SYDNEY H. WATERLOW.
G. W. SEITZ.

The Byron Weston Paper-Works, of Dalton, Mass., are owned and run by ex-Senator Byron Weston, who is a native of Dalton. His family came to Dalton, from Plymouth, near the commencement of the century. He has two mills running in connection. One mill is the rag or stock department; the other moulds and finishes the paper. This establishment has fourteen paper-engines, four steam-engines, three water-wheels, and has water from artesian-wells and springs enough to supply a small city, and is used for washing the stock, moulding the paper, &c.

Nothing is made in the establishment but first-class, strong, linen paper, for record-books, legal documents, ledgers, and journals, and for uses where age and long use is required. The paper is made of linen rags, new cloth, and such strong, clean, and white stock that alkali or acid bleaching is unnecessary; which injures the fibre of the stock, causing the paper to be tender and grow yellow by age.

Mr. Weston believes in making paper of the best of cloth or fibre;

* Signing Judge.

washing and cleansing with spring water, and using plenty of time in the process. The goods he exhibited at the Exposition were put up in the regular style, and from the common stock, and were not embellished with silk ribbons or gilded edges. The exhibit was composed of all the sizes of ledger and record paper, from Cap, Demy, and Royal up to Emperor and Leviathan; the last, weighing 1,000 pounds, and measuring 5 feet by 10 feet, being worth two dollars a sheet at wholesale. His "Centennial Register" was the largest and best made of any at the Exposition, and is said to be the largest book ever made in the United States. It was filled with names long before the close of the Exposition, though it was not thought possible to obtain names enough to fill the mammoth volume.

Paper from this mill has received the first premium — as the *best*, over all competitors — from the American Institute, New York, the Cincinnati Industrial Exposition, Massachusetts Charitable Mechanics' Association, Franklin Institute of Philadelphia, and others in the United States. It has now received a medal and diploma from the Centennial Exposition, as above, and said to be the best worded or highest given for paper.

Probably no other brand of paper is so widely known throughout the United States, among book-makers, book-keepers, and registers of deeds, &c., as the "Byron Weston Linen;" parties giving orders for heavy books constantly specifying that they must be made of "Weston, record-paper," every sheet of which is water-marked, and dated in the wet state.

Sir Sydney H. Waterlow, one of the judges at the Centennial, impressed with the merits of this industry and its products, honored the works with a visit and careful inspection, — a favor not paid any other paper manufactory in the United States, except those of Dalton, Mass.

LOWELL HOSIERY COMPANY, LOWELL, MASS.**A W A R D.****PRODUCT: Women's Plain Cotton Hose.**

Special adaptation to the use of the medium and working class, in regard to price and quality.

J U D G E S.

B. F. BRITTON.*
M. P. EMPEY.
W. H. CHANDLER.
W. O. LINTHICUM.
KANITZ.

DIETZ MONNIN.
GEO. HEWSTON.
E. N. HORSFORD.
MODEST KITTARY.

The Lowell Hosiery Company was started early in the spring of 1869, mainly through the efforts of Mr. W. F. Salmon; and a charter issued to "William F. Salmon, Thomas Nesmith, Hocum Hosford, their associates and successors," May 26, 1869. The capital stock was by charter limited to \$200,000; of which, \$50,000 was assessed June 14, 1869, and \$50,000 Sept. 15, 1869; the company being started on a basis of \$100,000 capital.

Jan. 15, 1872, an additional assessment of \$75,000 was levied; making the present paid-up capital \$175,000, mostly owned in Lowell.

The mills are now perfectly adapted to making and finishing hose from cotton in the bale, with a present capacity of about 800 dozen pairs per day, and are giving employment to about 200 persons.

The company was formally organized June 10, 1869, by the choice of

President.

C. P. TALBOT.

Treasurer.

HOCUM HOSFORD.

Directors.

ALBERT WHEELER.
ALDEN B. BUTTRICK.
CHARLES KIMBALL.

CYRUS H. LATHAM.
JOSIAH GATES.

Clerk.

W. F. SALMON.

* Signing Judge.

The Board of Directors elected Mr. W. F. Salmon as manager, and authorized the immediate purchase of mills and machinery. Yarn was put into market and hose invoiced early in January, 1870.

The company has continued under the same management to the present time (the only change being the election of Mr. Edward Hastings as director, Nov. 14, 1876, in place of Albert Wheeler, deceased); and has paid regular semi-annual dividends, in January and July, varying from three to five per cent, with the single exception of January, 1874.

The machinery has been kept in full operation during the past two years, and its products have found ready sale.

The specialty of the company is the manufacture of WOMEN'S PLAIN COTTON HOSE, bleached and unbleached; and thus far it has not made any men's or misses' hose, neither has it undertaken to cater to the prevailing fancy for striped and colored hose.

The exhibit of the company at the International Exhibition, Philadelphia, 1876, was of goods taken from *regular work* of the mill, and put up in the *usual manner for the trade*; and any style in its case could be found by calling upon the selling agents, Messrs. Wright, Bliss, & Fabyan, of Boston, New York, and Philadelphia, of exactly same quality of yarn and style of finish.

YORK MANUFACTURING CO., SACO, ME.

The United States Centennial Commission has examined the report of the judges, and accepted the following reasons, and decreed an award in conformity therewith.

REPORT ON AWARDS.

PRODUCT: Tickings, Nankins, Denims, and Fancy Woven Fabrics.

Name and address of Exhibitor:

YORK MANUFACTURING COMPANY, SACO, ME.

The undersigned, having examined the product herein described, respectfully recommends the same to the United States Centennial Commission for award, for the following reasons, viz.:—

For Nankins, plaids and stripes, excellent. Denims, plaids and stripes, very novel. Tickings; peculiarly adapted for good service. In their goods the designs are excellent and novel; the weaving very even, and the quality is unsurpassed.

A. GOLDY.

(Signature of the Judge.)

Approval of Group Judges.

EDWARD ATKINSON.
HUGH WADDELL, JR.
EDWARD RICHARDSON.
A. D. LOCKWOOD.
CHARLES H. WOLFF.
SAMUEL WEBBER.
GEORGE O. BAKER.

ISAAC WATTS.
W. W. HULSE.
DON ALVARDO DE LA GANDARA.
GUSTAV HERRMANN.
JOSEPH DASSI.
MENI RODRIGUES DE VASCON-
CELLOS.

A true copy of the record:

FRANCIS A. WALKER,
Chief of the Bureau of Awards.

Given by authority of the United States Centennial Commission.

A. T. GOSHORN, *Director-General.*
J. R. HAWLEY, *President.*

J. L. CAMPBELL, *Secretary.*

The York Manufacturing Company, of Saco, York County, Maine, was chartered March 16, 1831, with a capital of \$300,000 (divided into 300 shares, of \$1,000 each). It succeeded the Saco Manufacturing Company, whose property they bought in April, 1831.

The then existing mills were immediately afterwards enlarged; and from time to time since, by rebuilding, connecting, and constructing new works, have increased, until they now contain 33,000 spindles and 900 looms (mostly fancy), with the necessary dye-houses, bleachery, &c. The production at first was of coarse, twilled, plain, and colored goods; but is now almost exclusively colored, consisting of cottonades, ticks, denims, and dress goods, in very great variety and of excellent quality and reputation.

The original capital was increased, in August, 1833, to \$540,000; in May, 1835, to \$600,000; in August, 1835, to \$750,000; in November, 1836, to \$1,000,000; and in March, 1849, by a stock dividend, to \$1,200,000, — its present amount.

The success of this corporation during the forty-six years of its existence has been very remarkable; much of which is justly due to Mr. Samuel Batchelder, of Cambridge, Massachusetts (now in his 93d year), one of the originators of the company, its first agent from 1831 to 1846, its treasurer from 1856 to 1867, — in all twenty-six years. Mr. Pliny Cutler, its first treasurer, so remained until 1853 (twenty-two years).

The Everett Mills, of Lawrence, Mass., is an offshoot from this company; having been organized, mainly by York stockholders, in 1860, for making similar goods: also, the Saco Water-Power Company; and, indirectly, the Pepperell and Laconia Companies of Biddeford, their sites and mill privileges having been bought from this company in 1836. Messrs. Ward & Davis and William H. Davis & Company were its selling agents from 1831 to 1837; Messrs. A. & A. Lawrence & Company, from 1837 to 1865; and Messrs. George C. Richardson & Company, from 1865 to the present time.

Its present principal officers are —

Mr. JAMES ELLISON, President; since February, 1863.

Mr. WILLIAM G. SALTONSTALL, Treasurer; since April, 1874.

Mr. IRA H. FOSS, Agent at Saco; since September, 1867.

ATLAS MANUFACTURING COMPANY, NEWARK, N. J.**A W A R D.****PRODUCT: Wool-Burring Machines.***Wool-burring machines of rapid and effective action.***J U D G E S.**

JOHN L. HAYES.*
 ELLIOT C. COWDIN.
 CHARLES LE BOUTILLIER.
 CHARLES J. ELLIS.
 J. D. LANG.
 Consul GUSTAV GEBHARD.
 THEODORE BOCHNER, Jr.
 HENRY MITCHELL.

Dr. MAX WEIGERT.
 LOUIS CHATEL.
 CARL AENBERG.
 HAYAMI KENZO.
 JOHN G. NEESER.
 AUGUST BEHMER.
 ALBERT DANINOS.

S. R. PARKHURST, Newark, N. J.

We desire to call the attention of woollen manufacturers to the patent single and double burring machines, with patent steel-ring feed-rollers, invented by Mr. S. R. Parkhurst. To specify in detail each important point in these machines would require too much time and space. They are, with their improvements, the result of nearly forty years of labor, experiment, and practical experience.

We have built, and now have running in various parts of this country and Europe, over five thousand of these machines. They are adapted to clean all grades and qualities of wool, from all their various impurities. We claim for them that they prepare the wool better for working, do twice the execution of any other, leave a longer staple, and clean equal to the best; while the cost is not one-half of those of foreign make, and no more than those of home manufacture of less merit; thus superseding foreign machines.

In our double-cylinder burr-picker, a recent improvement includes a beater, attached to the spout, for the purpose of more thoroughly

* Signing Judge.

mixing and cleaning the wool. Wool running once through this machine is dusted, burred, and picked, ready for the cards; making a great saving of labor and power.

We also manufacture a steel-ring single and double burring machine, applied to first and second breakers and finishers of carding machines. Patents granted June, 1862; March, 1865; July, 1866; and January, 1870.

HARD-END CARD-MACHINE.— We also manufacture a steel-ring waste-card, double and single, for working up all kinds of hard and soft twisted yarns.

A large size of the improved double-cylinder burring-picker was in operation in Machinery Hall, at the International Exposition, where it cleaned and burred fine wool at the rate of 600 pounds per hour, in a manner superior to any other machine in use. For carpet-wools, it cleans 1,000 pounds per hour. All practical manufacturers must be aware that, upon the character of the machine, the quality of the goods produced largely depends. Wool improperly burred and carded is incapable of producing satisfactory results in the manufacture of woollen goods.

L. L. BROWN PAPER COMPANY, SOUTH ADAMS, MASS.**A W A R D.****PRODUCT: Paper.**

This exhibit contains bond, ledger, and bank folio, both wove and laid, papers. The bond is good, and well sized. The other papers are all remarkable for good qualities; the ledger papers possessing unusual strength and beauty, and a sizing that resists the severest tests of erasure and rewriting.

J U D G E S.

JAMES M. WILCOX.*
C. O. CHAPIN.
WM. FAXON.
EDWARD CONLEY.

H. T. BRIAN.
Sir SYDNEY H. WATERLOW.
G. W. SEITZ.

L. L. BROWN PAPER COMPANY.

L. L. BROWN, *President.*

T. A. MOLE, *Treasurer.*

This corporation was organized June 11, 1873, by members of the old firm of L. L. Brown & Co., who, for twenty-five years, had made a specialty of ledger papers. The demand for the well-known brand of paper, "Greylock Mills," has been such that new buildings have been built, and new machinery added, until now it is the largest and most complete establishment of the kind in the country, — running four machines and eighteen engines; one of which is the largest washing engine in use, carrying 1,500 pounds of stock. The production is five tons of first-class papers per day.

These papers are made for town, county, and State records, ledgers and journals, — for all purposes where great strength and long use are required. They are double-sized and loft-dried, and will stand any climate or acid ink, and are used by all first-class blank-book-makers throughout the United States. The exhibit at the Centennial

* Signing Judge.

Exposition was regarded by all as the finest there shown, receiving the *highest and only* award given for papers that would stand the test of *erasure and rewriting*. A copy of the award is given on preceding page in full.

INTERNATIONAL EXPOSITION, PHILADELPHIA, 1876.

The United States Centennial Commission has examined the report of the judges, and accepted the following reasons, and decreed an award in conformity thereto.

PHILADELPHIA, Feb. 9, 1877.

REPORT ON AWARDS.

PRODUCT: Paper.

Name and Address:

L. L. BROWN PAPER COMPANY,
SOUTH ADAMS, MASS.

The undersigned, having examined the product herein described, respectfully recommends the same to the United States Centennial Commission for award, for the following reasons, viz.:—

“This exhibit contains bond, ledger, and bank folio, both wove and laid, papers. The bond is good, and well sized. The other papers are all remarkable for good qualities; the ledger papers possessing unusual strength and beauty, and a sizing that resists the severest tests of erasure and rewriting.”

JAMES M. WILCOX.

(Signature of the Judge.)

Approval of Group Judges.

C. O. CHAPIN.
SIDNEY H. WATERLOW.
WILLIAM FAXON.

EDWARD CONLEY.
GUSTAVE W. SEITZ.
H. T. BRIAN.

A true copy of the record:

FRANCIS A. WALKER,

Chief of the Bureau of Awards.

Given by the authority of the United States Centennial Commission.

A. T. GOSHORN, *Director-General.*

J. R. HAWLEY, *President.*

J. L. CAMPBELL, *Secretary.*

MASSACHUSETTS COTTON MILL, LOWELL, MASS.**A W A R D .****PRODUCT: Cotton Fabric.**

Plain, serviceable, standard, and medium sheeting; round and well-spun yarn, evenly woven; especially fitted for common wear; at low cost.

J U D G E S .

EDWARD ATKINSON.
HUGH WADDELL, Jr.
EDWARD RICHARDSON.
A. D. LOCKWOOD.
CHARLES H. WOLFF.
SAMUEL WEBBER.
GEORGE O. BAKER.
ISAAC WATTS.*

W. W. HULSE.
DON ALVARO DE LA GANDARA.
ARNOLD GOLDY.
GUSTAV HERRMANN.
JOSEPH DASSI.
MENI RODRIGUES DE VASCON-
CELLOS.

The Massachusetts Cotton Mills, at Lowell, Mass., were incorporated in the year 1839, with a capital of \$1,200,000, for the purpose of manufacturing standard Drills, Sheetings, and Shirtings, suitable for export. The mills were put in operation in the years 1840, 1841-42, with about 25,000 spindles and 800 looms. In 1846, the capital stock was increased to 1,800,000, and the mills and machinery of the Prescott Manufacturing Company were purchased, which, with the machinery named above, made 45,720 spindles and 1,459 looms.

Additions to buildings and machinery have been made at various times; and the mills contained, on the first day of January, 1877, 103,632 spindles and 3,056 looms.

Till the year 1861, the greater part of the product of the mills, amounting up to that time to 450,000,000 yards, had been sold for export. This business, however, was entirely destroyed by the civil war, obliging great changes to be made in the styles of goods to adapt them to domestic use; and, accordingly, sheetings and shirtings of a

* Signing Judge.

higher grade, and in considerable variety, have since been made, better adapted to the wants of this country.

The demand for goods for export having in a measure revived within the last few years, the mills are again making large quantities of standard drills, standard sheetings, and the light sheetings and shirtings formerly made.

The styles of goods now being made are thirteen, consisting of

Standard Drills, brown, bleached, and blued, marked "Massachusetts. D."

Fine drills, marked "Massachusetts. G."

Standard sheetings, marked "Mass. M F."

Heavy sheetings, marked "Mass. A."

Heavy sheetings, marked "Medfords."

Medium sheetings, marked "Mystic River."

Medium sheetings, marked "Mystic River, 33 inch."

Fine sheetings, marked "Massachusetts. B B."

Fine shirtings, marked "Massachusetts. E."

Medium shirtings, marked "Massachusetts. C."

Heavy shirtings, marked "Massachusetts. J."

Canton flannels, marked "Mass. R. F."

Canton flannels, marked "Mass. R R."

The Massachusetts Mills produces goods without weighting or loading; using only dressing that is absolutely necessary for successful weaving, which increases the weight of the goods from two to three per cent only.

At the Centennial Exhibition the claim was made for plain, serviceable, standard sheetings, drills, &c., made of good material, with not more than three per cent of sizing; evenly spun and woven; especially fitted for common wear; at low cost.

These mills employ about 1,600 hands.

In the year 1876, there were used 25,808 bales cotton, in the manufacture of 36,892,477 yards of cloth.

Mr. George Atkinson, at Boston, is the Treasurer of the Company.

Mr. Frank F. Battles, at Lowell, is the Manufacturing Agent.

Messrs. George C. Richardson & Co., of Boston and New York, are the Selling Agents.

JAMES BUTTERWORTH & SON, PHILADELPHIA, PA.**A W A R D.****PRODUCT: Rag-Picker and Rag-Duster.**

Two machines, a rag waste and shoddy picker, and a rag-duster, both of good workmanship.

J U D G E S.

JOHN L. HAYES.
 ELLIOT C. COWDIN.
 CHARLES LE BOUTILLIER.
 CHARLES J. ELLIS.
 J. D. LANG.
 Consul GUSTAV GEBHARD.
 THEODORE BOCHNER, Jr.*
 HENRY MITCHELL.

Dr. MAX WEIGERT.
 LOUIS CHATEL.
 CARL ARNBERG.
 HAYAMI KENZO.
 JOHN G. NEESER.
 AUGUST BEHMER.
 ALBERT DANINOS.

C L A I M.

This establishment was founded in 1866, by James Butterworth, who had twenty years' experience on woollen machinery, as a manager and practical machinist in woollen factories. He started at No. 2 South Twenty-third Street, Philadelphia. Being burnt out in 1874, he moved to 262 Adams Street, at that time building the present works. His son, Joseph Butterworth, was associated in partnership in 1872.

The business of the firm has consisted, from the beginning, almost entirely in manufacturing shoddy machinery; such as rag and waste pickers, rag-dusters, shoddy-lumpers, shake-willows, &c. Re-lagging and toothing picker cylinders is a specialty. They have many special improvements in their machinery, and have received great praise from the beginning from all parts of the country, and manufacture more largely than any other establishment in the same specialties. A large number of their machines have hitherto been supplied to orders from New York and the New England States.

* Signing Judge.

BERKELEY COMPANY, PROVIDENCE, R. I.

A W A R D.

PRODUCT: Cotton Fabrics.

Commended for superior quality of lawns and nainsooks, and especially for fine sateens, No. 100 warp, 150 filling, 350 picks of filling to the inch; the sateen being one of the finest, and supposed to be the very finest, fabric made in the United States. It deserves special mention for the great skill required in its production.

J U D G E S.

EDWARD ATKINSON.
SAMUEL WEBBER.
GEO. O. BAKER.
A. GOLBY.
CHAS. H. WOLFF.
HUGH WADDEL, Jr.
ISAAC WATTS.*

MENI RODRIGUES DE VAS-
CONCELLOS.
JOSEPH DASSI.
A. DE LA GANDARA.
A. D. LOCKWOOD.
E. RICHARDSON.
WILLIAM W. HULSE.
GUSTAV HERRMANN.

Agents.

GODDARD & PAGE.

Selling Agents.

WOODWARD, LAWRENCE, & Co., New York.
WHEELWRIGHT, ANDERSON, & Co., Boston.

C L A I M.

The Berkeley Company was incorporated in 1872, having for its object the production of a class of white goods which could be found only among the importers.

The success of the enterprise depended solely upon the ability to offer to consumers an article, not only superior in manufacture and finish to the foreign, but also cheaper. This, it is claimed, has been accomplished.

For the purpose of finishing these goods, the Lonsdale Company, of Providence, R. I., whose owners are the principal proprietors of the Berkeley Company, erected a bleaching and finishing establishment, containing the most improved machinery for the finishing of fine fabrics that could be found in this country and in England.

The Berkeley Company would call particular attention to the award of the judges of textile fabrics of the United States Centennial Exhibition upon the qualities of their production, with the assurance that the fine grades of cotton goods they may present to consumers shall be held, in quality, equal to the highest standard.

* Signing Judge.

NASHUA MANUFACTURING CO., NASHUA, N. H.**A W A R D.****PRODUCT: Cotton Fabrics.**

Commended for bleached and unbleached cotton fabrics, of medium grades, and excellent quality in all respects.

J U D G E S.

EDWARD ATKINSON.
HUGH WADDELL, Jr.
ED. RICHARDSON.
A. D. LOCKWOOD.
CHAS. H. WOLFF.
SAMUEL WEBBER.
GEORGE O. BAKER.

ISAAC WATTS.*
W. W. HULSE.
DON ALVARO DE LA GANDARA.
ARNOLD GOLDY.
GUSTAV HERRMANN.
JOSEPH DASSI.
MENI RODRIGUES DE VASCON-
CELLOS.

NASHUA MANUFACTURING COMPANY.

(Incorporated 1823. Capital \$1,000,000.)

EXTRACT FROM ACTS OF INCORPORATION.

SEC. 1. *Be it enacted by the Senate and House of Representatives in General Court convened,* That Daniel Abbot, Moses Tyler, and Joseph Greeley, and such other persons as shall associate with them, and their successors and assigns, shall be, and hereby are, constituted and made a corporation by the name of the Nashua Manufacturing Company.

SEC. 2. *And be it further enacted,* That the said corporation be, and the same is, hereby empowered to establish, manage, and carry on the manufacture of cotton, woollen, iron, and other lawful manufactures, on and near the Nashua River, in Dunstable (now Nashua), and also any and all such branches of manufacture and trade as can be conveniently managed and carried on by said company or corporation.

The first meeting of the associates was held June 26, 1826, when by-laws were enacted, and the following officers elected : —

Directors.

DANIEL ABBOT.
DANIEL WEBSTER.
JOHN KENDRICKS.

JOSEPH GREELEY.
MOSES TYLER.

* Signing Judge.

Treasurer.

AUGUSTUS PEABODY.

Resident Agent.

IRA GAY.

Commenced operations with 1,000 spindles in 1825 ; increased the next year to 5,000 spindles, with a production of about 24,000 yards of cloth per week.

Second mill built in 1827, and started with 6,000 spindles ; third mill started in 1836, with 6,100 spindles ; and the fourth mill, in 1845, with 6,700 spindles.

The other mills, in the mean while, had been enlarged ; so that the total capacity at this time (1845) was 32,074 spindles, and 940 looms, with a production of about ten and a half million yards of cloth per annum, principally standard sheetings and shirtings. In 1865, the works had increased to 41,292 spindles and 1,243 looms, and the style of goods was changed from standard sheetings to a finer grade which have been manufactured since that time. The mills are now running about 75,000 spindles and 1,800 looms, producing about seventeen million yards per annum of medium sheetings and shirtings of various widths, cotton flannels and print cloths, using about 13,000 bales of cotton per annum, and about 1,000 tons of coal ; giving employment, in the various departments, to 700 females and 300 males. The water-power is derived from a dam at Mine Falls, across the Nashua River, having thirty-seven feet head and fall, and conducted by a canal, of three miles in length, to the mills in the city of Nashua, N. H. ; where there are four turbine water-wheels, giving about 1,900 horse-power, and, as auxiliary in case of drought, one Corliss engine of 300 and one of 80 horse-power.

The present organization of the company is as follows : —

Directors.

JOHN A. BURNHAM.
J. INGERSOLL BOWDITCH.
EDWARD SPALDING.

WILLIAM S. DEXTER.
ABBOTT LAWRENCE.

Treasurer.

JAMES S. AMORY.

Resident Agent.

R. A. MAXFIELD.

Selling Agents.

UPHAM, TUCKER, & Co., Boston and New York.

FALES & JENKS MACHINE CO., PAWTUCKET, R. I.**A W A R D.****PRODUCT:** Mayor's Combined Fly Frame and Speeder.

Commended for good substantial machinery, novelty of details and action, utility, fitness for the purpose intended, economy, and quality of work produced.

J U D G E S

EDWARD ATKINSON.
HUGH WADDELL, Jr.
ED. RICHARDSON.
A. D. LOCKWOOD.
CHARLES H. WOLFF.
SAMUEL WEBBER.
GEORGE O. BAKER.
ISAAC WATTS.

W. W. HULSE.
DON ALVARO DE LA GANDARA.
MENI RODRIGUES DE VASCON-
CELLOS.
ARNOLD GOLDY.
GUSTAV HERRMANN.*
JOSEPH DASSI.

The Fales & Jenks Machine Company is established at Pawtucket, R. I. This town has won renown, from the fact that it was the first place in America where cotton spinning was accomplished by water-power. Samuel Slater came hither late in 1789, A. D. Before that time, however, the village of Pawtucket had been celebrated, for over a century, for the manufacture of iron. Providence plantations were settled in 1636, and then embraced nearly all of the northern part of the State. In 1655, that part of Providence plantations lying near Pawtucket Falls, and now constituting the western division of the town of Pawtucket, was settled by a young man named Joseph Jenks. He set up a forge at that time, just below the falls.

His father also bore the name of Joseph, and originally settled in Lynn, Mass. A historian of that city speaks of him in the following strain: "Joseph Jenks deserves to be held in perpetual remembrance in American history, as being the first founder who worked in brass and iron on the Western Continent." In May, 1646, he obtained a patent, from the General Court of Massachusetts, for "making engines for mills to go with water," and a new invented "saw-mill." And in 1655 he obtained another patent for an improvement in the manufacture of scythes. His son, the founder of Pawtucket, became the progenitor of an energetic race; of whom several now live in Rhode Island, and cleave to the business which gave their ancestors thrift and fame.

* Signing Judge.

One of the descendants of Joseph Jenks was Mr. Alvin Jenks. In 1830, he formed a copartnership with Mr. David G. Fales, in Central Falls, — a village of the old town of Smithfield, anciently included in Providence plantations. The firm took the style of Fales & Jenks, and began the manufacture of cotton machinery. In a few years, they commenced making Hubbard's Patent Rotary Pump. From time to time they added such improvements to the original design as to gain almost a monopoly of the manufacture of these pumps. In 1845, they began to make ring-spinning frames; and, in 1846, constructed ring twisters, which were among the first of such machines in the country.

In 1856, Mr. Alvin Jenks died, and in a few years Mr. Fales retired from the firm. Meanwhile Mr. John R. Fales, son of the elder Mr. Fales, and Messrs. Alvin F. and Stephen A. Jenks, sons of the elder Mr. Jenks, were admitted as copartners. On the first of September, 1876, however, they formed a stock company, and assumed the present designation.

In 1865, their establishment was removed from Central Falls to Pawtucket. As the company needed more spacious grounds, they bought, by successive purchases, eighty acres of land. Of this they have sold about twenty-five acres to the Conant Thread Company. Their own buildings are quite extensive, and cover a large area.

Their main edifice is 550 by 63 feet, and is run by an engine of 100 horse-power. Beside this, there are foundries, fire-proof pattern shops, lumber sheds, blacksmith shops, annealing furnaces, &c. The increase of business has compelled a multiplication of such shops; for the company, beside the articles already named, manufacture Houston's turbine water-wheel, Mayor's combined fly-frame and speeder, and the revolving piston water-meter. And it may also be mentioned, that this company manufactured, for the recently constructed water-works of Providence, hydrants, water-gates, taps, and stops, and did a great deal of special work; so that they received from that city \$200,000. And, beside the articles already enumerated, the company make Rabbeth's patent self-oiling spindle. This well-known spindle is not only widely used in this country, but is exported in great quantities to Scotland. Within a few months, too, the company have devised an improved wet twister. In contriving this, they have remodelled the Rabbeth spindle, and so increased its capabilities that they have just made a contract with the Clark Thread Company to supply them with a large number of the new twisters.

Beside the award at the head of this article, the company also received awards for the turbine water-wheel, and the revolving-piston meter.

G. H. PRINDLE, PHILADELPHIA, PA.**A W A R D.****PRODUCT: Knit Goods.**

A fine display of novelties made of zephyr yarn, and specially meritorious as to price, style and quality.

J U D G E S.

W. H. CHANDLER.
WILLIAM O. LINTHICUM.
BENJAMIN F. BRITTON.
GEORGE HEWSTON.
E. N. HORSFORD.

CHARLES F. DIETZ-MONNIN.
MODESTE KITTARY.
EDWARD KANITZ.
M. P. EMPEY.

In 1872, while stationed at League Island, in United States naval service, Mr. Prindle saw an old, retired quartermaster making a tidy, or lamp mat, made on the old, square frame known as a German peg-frame: something the man had learned while in the East India service. He made Mr. Prindle one for one dollar; which was about 8×10 inches square, and consisted of a continuous roll of balls, made by being cut both ways. Mr. Prindle took it home, and, while showing it to his wife, he held it by diagonal corners; and pulling it, formed a diamond-shaped article. He remarked that it would make a handsome hood, if made in that shape. He ran a string through the back of it to hold it in position. His wife crocheted strings on the two ends, thus forming a very pretty hood; there being at that time a great demand for new styles of hoods. Seeing that it was a pretty thing, he took it to one of the largest manufacturers of fancy goods and hosiery in Philadelphia. It was admired; and he received an order for one dozen, provided he could make the strings to match the hood. This requirement, for the strings to be made of the same pattern as the hood, caused him to study to improve the frame so that he could accomplish this. He improved the square frame by introducing a groove and tongue, so that the width could be varied to any extent. This order was given in the latter part of 1872; and then he applied for a patent on an improved shawl and fringe frame, which was granted three weeks later. During the time the patent was pending, he finished the one dozen hoods, and received an order to make twenty-five dozen, as soon as practicable.

Starting with three girls and on contract work, without one dollar of capital, he increased his force gradually up to twenty, and made, during 1873, 4,000 dozen hoods of that pattern and others. The two years following, he changed from the hood, and made what was called the Russia, Alaska, and Polar muffs and boas; making 10,000 dozen of the first alone. In the fall of 1875, worsted dress-trimmings being very popular, he turned his attention to those articles; and he took out patents for every design which proved popular, such as the Hercules and Pompadour; increasing his force till he worked 200 hands on dress trimmings alone. The demand being great and the trimmings popular, certain manufacturers in Philadelphia and New York infringed on his designs; making poor imitations, until he stopped them by appeal to the courts. In the fall of 1876, he originated the designs of ball trimmings, which are now so popular throughout the United States. The Prindle machines are adapted to make these, in a style superior in beauty and quality to that in which they can be made by hand. And the fact that they are the only machines that can be used to manufacture that trimming gave him the control of this whole trade in the United States.

In January, 1877, a wealthy manufacturer of Philadelphia paid Mr. Prindle \$2,000 for the use of thirty-five frames, in his own establishment, and tripled his money in two months. This gentleman is the only person besides Mr. Prindle having the right to use the frames at all.

The same machines can be used for the manufacture of hoods, scarfs, robes, shawls, bed-quilts, children's sacks, boas, muffs, &c., — in fact, any style of fancy goods in that line made by power or by hand. The great advantage of these machines is, that on them can be made any design that can be made on a loom; while the *vice versa* statement would be far from true. A second advantage is the great saving of labor; one girl being able to do the work of four girls. At the present time, 500 girls are working on the Prindle frames, in Philadelphia. A second building, erected, this spring, opposite the old one, doubles his previous factory room.

Mr. Prindle's office is at 2046-2048 Marshall Street, above Norris Street, in his factory. Samples of the goods are exhibited also in the new Permanent Exposition at Philadelphia. No. of exhibit is 375.

Mr. Prindle has pending in Washington, at the time of writing this article, a patent for a machine for finishing dress and cloak trimmings, whether woven on hand or power looms, which saves two-thirds of the labor at present required. Rights under this new patent will be sold to manufacturers, or given on royalties.

J. A. STAMBACH & CO., PHILADELPHIA, PA.

REPORT.

PRODUCT: Ladies' Fine Furs.

A good display of Russian sable, silver-fox, cross-fox, and seal skin, among cloaks and muffs. Commended for great variety, elegant style, and fine workmanship.

JUDGES.

W. H. CHANDLER.
WILLIAM O. LINTHICUM.
BENJAMIN F. BRITTON.
GEORGE HEWSTON.
E. N. HORSFORD.

CHARLES F. DIETZ-MONNIN.
MODESTE KITTARY.
EDWARD KANITZ.
M. P. EMPEY.

The house was established in 1840, by George G. Stambach, at 710 North Second Street, where he remained twenty-six years, until 1866; when he joined his son, who had opened a branch store at 826 Arch Street in 1861, under the present firm name of John A. Stambach & Co. Taking a natural pride in their business, abhorring imitations and deceptions in goods, they knew no reason why the fur business should not be conducted on the same honorable principles as other branches with which the public were better acquainted. Being masters of their trade, only employing the best fur-cutters, sewers, and finishers, it was always their aim and object to supply fashionable and reliable qualities of furs, at moderate prices; and their business was established on this basis.

Their display at the Centennial Exhibition was made in a handsome walnut and plate-glass case, 12 feet long, 5½ feet wide, and 10 feet high: containing a Shetland seal sacque, trimmed with sea-otter, and lined with squirrel flank; a reversible royal ermine and silk opera talma and carriage cloak combined; a mink sable sacque, thirty-six inches deep, without cross seams, and tail pendants; also, sets of boas and muffs in Russian sable, Hudson Bay sable, mink sable, sea otter, Shetland seal, Alaska seal, silver fox, cross fox, white fox, chinchilla, royal ermine, grebe otter, beaver, lynx, silver raccoon, black marten, badger, gray krimmer, &c. Seal caps, hats, and gloves for ladies and misses; and seal caps, collars, gauntlets, and gloves for gentlemen. Their motto has always been, "All goods warranted as represented, and satisfaction guaranteed."

BARBOUR FLAX SPINNING CO., PATERSON, N. J.**A W A R D.****PRODUCT: Flax, Yarns, and Threads.**

Commended for excellence in quality and color of thread, general utility of product.

J U D G E S.

EDWARD ATKINSON.
HUGH WADDELL, JR.
EDWARD RICHARDSON.
A. D. LOCKWOOD.
CHARLES H. WOLFF.
SAMUEL WEBBER.
GEORGE O. BAKER.
ISAAC WATTS.

W. W. HULSE.
DON ALVARO DE GANDARA.
MENI RODRIGUES DE VASCON-
CELLOS.
ARNOLD GOLDY.*
GUSTAV HERRMANN.
JOSEPH DASSI.

The requisite qualities for good thread are great strength and evenness. To secure these, a long fine fibre is indispensable.

A firm, but not hard, twist: if too hard, the wax merely glazes the surface, and rubs off in working; if too loose, the strands open and the strength is impaired.

Absolute uniformity in numbers, without which it is impossible for manufacturers to secure regularity in stitching.

These points are combined in Barbour's thread to an eminent degree. Their machine thread is entirely free from knots of such size as to interfere with its passage through the eye of the needle.

They use none but the best Irish or like superior flax, in fine threads.

* Signing Judge.

WILLIAM SIMPSON & SONS, PHILADELPHIA, PA.**A W A R D.****PRODUCT: Printed and Dyed Cotton Fabrics.**

Commended for great variety, novelty, and excellence in design and execution, in mourning and half-mourning prints, ultra-marine blues, garancine chocolates, and dyed calicoes in solid black alpaca finish, and for regularity and evenness in fabrics.

SAMUEL WEBBER.*(Signature of the Judge.)**Approval of Group Judges.*

EDWARD ATKINSON.
M. R. DE VASCONCELLOS.
GUSTAV HERRMANN.
WILLIAM W. HULSE.
JOSEPH DASSI.
E. RICHARDSON.

A. DE LA GANDARA.
H. WADDELL, Jr.
A. GOLDY.
CHARLES H. WOLFF.
A. D. LOCKWOOD.
GEORGE O. BAKER.

A true copy of the record:

FRANCIS A. WALKER,
Chief of the Bureau of Awards.

Given by authority of the United States Centennial Commission.

A. T. GOSHORN, *Director-General.*
J. R. HAWLEY, *President.*

J. L. CAMPBELL, *Secretary.*

The Eddystone Manufacturing Company, Limited, produce the cotton prints known to the trade as "The William Simpson & Sons'" mourning and half-mourning prints, solid blacks, alpaca finish, fast blacks, silver grays; also the Eddystone chocolates, fancies, haircloth, cheviots, and anchor shirtings, &c. These goods are all printed on selected, best extra, 64 square 28-inch cloths.

This industry was founded, in 1834, by William Simpson, Sen., — the President of the company, — at Falls, Schuylkill, in the environs of Philadelphia; where he carried on the printing of silk handkerchiefs, and cotton goods of various styles, until about 1847. From that time until

within a few years, he confined himself almost exclusively to the production of mourning prints and solid blacks. He was among the first to produce aniline black color successfully in large quantities, and received a medal for a fine display of that color in the American Institute Exhibition of 1869. In 1869, the firm of William Simpson & Sons was formed, by admitting Thomas and William Simpson, Jr. The old print-works was condemned as a part of the land required for Fairmount Park, and finally taken in 1876.

The firm commenced building the Eddystone Print Works, near Chester, on the Delaware, in October, 1873; and started printing there in April, 1875; completing it as it now stands, January, 1877. It is situated on a level plot of thirty-six acres, with fine wharf facilities for large vessels on the river, and ample supply of most excellent water; also, good railroad connections with Philadelphia and the coal regions. The buildings are: the engraving-room, office, and color-house, 80 by 190 feet; bleachery, 200 by 85 feet; cloth-room, 40 by 120 feet; boiler-house, 55 by 102 feet; white and dry-rooms, 120 by 85 feet; dye-house, 202 by 90 feet; acid house, 80 by 86 feet; boiler-house and steam-room, 202 by 55 feet,—all one story brick; and print-house two story, 300 by 85 feet; also, finishing and packing building, two story, 300 by 55 feet; and a fine machine and smith shop. There are forty houses on the property, and a reservoir. The machinery is all of the most modern improved kinds; and consists of 18 printing and padding machines, with the necessary bleaching, dyeing, and finishing machinery, driven by 34 engines,—the largest being a 250-horse Corliss. The steam is raised from 20 cylinder boilers, 750 horse-power, and 6 tubular boilers, 750 horse-power; making 1,500 horse-power, in all. The many improved machines, the unlimited supply of pure water, and fine light and airy buildings, well arranged and solidly constructed, make this one of the finest works in the country. Nothing that care and long experience could suggest was left undone to make it perfect; and no expense was spared to make the buildings durable, and secure safety from fire. All these great facilities have enabled the company to produce a much superior grade of work on all the old styles, as well as to introduce many new

lines of goods to the market. It has always been the policy of the company to produce nothing but first-class prints, in fast colors only, of patterns selected from the finest designs, and engraved at great expense, in the best manner. And every effort which the long experience and constant personal attention of the different members of the company can suggest, is constantly directed to making the product stand first in the market: for which they feel amply repaid by the very flattering report of the Jury of Awards of the Centennial Exhibition.

On Jan. 1, 1877, William Simpson & Sons transferred all their interest in the printing business to "The Eddystone Manufacturing Company, Limited," formed by the following persons, who are all engaged in the various departments of the company, or in selling the products: —

President.

WILLIAM SIMPSON, Sen.

Treasurer.

JAMES SIMPSON.

Secretary.

LINCOLN GODFREY.

THOMAS SIMPSON.
WILLIAM SIMPSON, JR.
JOHN U. FRALEY.

CHARLES E. WILD.
F. W. THOMAS.

The products of the company are sold exclusively by William Simpson, Sons, & Co., Philadelphia, New York, Boston, and Baltimore.

OTTO KACHLER, PHILADELPHIA, PA.**A W A R D.****PRODUCT: Stuffed Animals, Raw and Dressed Skins.**

Shows a good set of stuffed animals, raw and dressed skins, and fur robes, a new pattern of duster made from tails, and a very nice pattern of muffs for ladies, with crossed compartments able to contain all the small objects necessary to a lady; elegant and serviceable.

J U D G E S.

W. H. CHANDLER.
WILLIAM O. LINTHICUM.
BENJAMIN F. BRITTON.
GEORGE HEWSTON.
E. N. HORSFORD.

CHARLES F. DIETZ-MONNIN.
MODESTE KITTARY.
EDWARD KANITZ.
M. P. EMPEY.

C L A I M.

Muffs made up in this style correspond in appearance, when the satchel is closed, with others of the common style. It closes up without any extra fastening, by means of a hidden self-closing wire-spring. It is very handy to put away small articles, when shopping or traveling. It can be hung on the arm like a satchel, when ladies want their hands disengaged.

I desire capital to assist in putting them on the market.

PAWTUCKET HAIR-CLOTH CO., PAWTUCKET, R. I.**AWARD.****PRODUCT: Hair-Cloth.**

Commended for a handsome exhibit of upholstering hair-cloth, varied in color and width, and noticeable for the evenness and smoothness of fabrication, especially creditable as a new industry in this country; also, for originality in the application of automatic machinery to this fabrication.

JUDGES.

JOHN L. HAYES.
ELLIOT C. COWDIN.
CHARLES LE BOUTILLIER.
CHARLES J. ELLIS.*
J. D. LANG.
CONSUL GUSTAV GEBHARD.
THEODORE BOCHNER, Jr.
HENRY MITCHELL.

Dr. MAX WEIGERT.
LOUIS CHATEL.
CARL ARNBERG.
HAYAMI KENZO.
JOHN G. NEESER.
AUGUST BEHMER.
ALBERT DANINOS.

THE PAWTUCKET HAIR CLOTH CO., PAWTUCKET, R. I.

LYMAN A. COOK, *President.*

OLNEY ARNOLD, *Treasurer.*

DANIEL G. LITTLEFIELD, } *Agents.*
HENRY B. METCALF, }

We presented, for exhibition and competition at the Centennial Exposition, specimens of cotton-warp hair-cloth, for furniture covering. It was the product of self-feeding, automatic power-loom; the mechanism being so fully perfected that one weaver successfully operates each series of ten looms.

Recognition for excellence in fabric was claimed by us, — first, as a worthy product of the first strictly automatic power-loom for hair-cloth that has been regularly worked in the world; second, on its own intrinsic excellence, as compared with other cotton-warp hair-cloths, however and wherever made, as a whole, and in its several features of texture and dye, and (as is of great importance in this fabric) strength and evenness of the selvage or border.

* Signing Judge.

The award of the judges at the Centennial Exposition, as given above, is a very explicit acknowledgment of the justice of our claim and the merit of our goods.

We give, also, a further proof of this, in an extract from the detailed "official report of the judges," upon the entire list of textile manufactures represented at the Exposition, who say:—

"We may be permitted to dwell, in some detail, upon the exhibit of the fabric made by the Pawtucket Hair-Cloth Company, of Rhode Island.

"The peculiarity of their exhibit was, that it is the result of the first successful weaving of hair-cloth by power; the hand-loom being, as far as is known, used by all other manufacturers of this fabric, at home and abroad. The success of this company is due to their achievement of the work of picking up, and applying automatically, each individual hair which is to compose the texture of a hair filling, interlaced by a warp of cotton thread. This is accomplished by a little machine, which could be packed in a box two inches square. This machine (which is detachable for repairs) is attached to a loom, both the machine and loom being operated by power; and it forms the pivot upon which the whole manufacture rests. It is essential that the machine should pick up but one hair at a time. To accomplish this, the picker in the machine has a groove, which is invisible to the naked eye; so that the whole of this manufacture turns upon a point which can be seen only with a microscope. The loom is so adjusted that the movement of the web is arrested until the picker lifts the hair. The end of the hair is then seized by a rod, the end of which operates like a thumb and finger, and is carried transversely between the warps. This little apparatus is attached to 400 distinct looms in the establishment of the company. One girl tends ten looms; and this one girl, by means of this machinery, does the work requiring twenty operatives on hand-looms. By means of these appliances, this single establishment, employing only 150 work-people, produces 600,000 yards of hair-cloth per annum; each loom weaving five yards per day. It consumes annually 450,000 pounds of horse-hair, equivalent to the tails of 600,000 horses.

"The large exhibit showed the *unquestionable superiority* of these machine-made goods to the ordinary hand-loom fabrics." *

* *Vide Report of Board of Judges, in Group IX., Wool Fabrics, &c., Part 2d.*

FARR ALPACA COMPANY, HOLYOKE, MASS.**PRODUCT:** Black Alpacas, Mohairs, Cashmeres, and Serges.**CAPACITY:** 2,500,000 yards per annum.**A W A R D.**

An excellent exhibit of black alpacas, mohairs, cashmeres, and serges; all of superior manufacture, very regular in quality, evenly spun and woven, and of permanent color and finish.

J U D G E S.

JOHN L. HAYES.
ELLIOT C. COWDIN.
CHARLES LE BOUTILLIER.
CHARLES J. ELLIS.
J. D. LANG.
CONSUL GUSTAV GEBHARD.
THEODORE BOCHNER, Jr.
HENRY MITCHELL.*

Dr. MAX WEIGERT.
LOUIS CHATEL.
CARL ARNBERG.
HAYAMI KENZO.
JOHN G. NEESER.
AUGUST BEHMER.
ALBERT DANINOS.

C L A I M.

The Farr Alpaca Company, located at Holyoke, Massachusetts, was incorporated under the general statutes, Nov. 13, 1873, with a capital of \$250,000.

The first meeting of the promoters of the company was held just previous to the outbreak of the financial crisis in September, 1873; but, notwithstanding the general depression in business which followed, and the long-continued prostration of the trade of Bradford, England, the chief seat of the worsted industry, the company was firmly established, and has proved a decided success.

The erection of the buildings, which are built of brick, was commenced in December, 1873; and, six months after, a full range of goods was shown in New York, and at once took the front rank.

In view of the depressed state of trade, it was deemed advisable to only partially equip the mill at the start; but the first goods shown were so well received it was found necessary, in order to meet the

* Signing Judge.

demand, to at once fill up the mill to its full capacity, — 255 looms ; and duplicate combing, drawing, and spinning machinery was put in to enable the company to produce either lustre or soft goods.

Special care is taken in the selection of raw materials ; and all operations in dyeing and finishing (some of which are original) are conducted with a view of producing the brightest lustre and the clearest and most durable color.

The general agent of the company, who closely superintends every operation of manufacturing, has a thoroughly practical knowledge of the work in the various departments of the mill, from selecting and sorting the stock to dyeing and finishing the cloth ; and knows, by long experience, what results are needed in each department to produce goods of the highest standard of excellence.

The very satisfactory award on the company's exhibit at the Centennial Exhibition confirms the verdict of the trade on the productions of this, the youngest of America's worsted dress-goods mills. It is an explicit and positive expression, on all essential points, in the production of perfect goods, and is fittingly supplemented by Mr. Mitchell, of Bradford, the English judge of award, in his report to the British government ; in which he says, "The alpacas, cashmeres, and serges shown by the Farr Alpaca Company were specially good,"—a meed of praise accorded by him to no other mill.

These unqualified expressions leave nothing to be said by the company in praise of its own goods. They would merely add, that they are determined to maintain their position at the head of this industry, and will continue to spare neither effort nor expense to meet the requirements of the best trade.

OFFICERS OF THE COMPANY.

President, GURDON BILL,
Springfield, Mass.

Treasurer, JOSEPH METCALF,
Holyoke, Mass.

General Agent, H. M. FARR, Holyoke, Mass.

Selling Agents, COFFIN, ALTEMUS, & Co., 79 & 81 Worth St., New York ;
220 Chestnut Street, Philadelphia ; 13 German Street, Baltimore.

PEACEDALE MANUFACTURING CO., PEACEDALE, R. I.

A W A R D.

PRODUCT: Lastings, Shawls, and Worsted Suitings.

An excellent exhibit of eleven thread and other numbers of lastings, of very creditable manufacture, and well adapted for shoe purposes; also, worsted suitings of excellent manufacture, and shawls in great variety. The all-wool, cheap shawls are especially creditable.

J U D G E S.

JOHN L. HAYES.
ELLIOT C. COWDIN.
CHARLES LE BOUTILLIER.
CHARLES J. ELLIS.*
J. D. LANG.
CONSUL GUSTAV GEBHARD.
THEODORE BOCHNER, JR.
HENRY MITCHELL.

DR. MAX WEIGERT.
LOUIS CHATEL.
CARL ARNBERG.
HAYAMI KENZO.
JOHN G. NEESER.
AUGUST BEHMER.
ALBERT DANINOS.

C L A I M.

THE PEACEDALE MANUFACTURING CO.,

PEACEDALE, R. I.

At Peacedale, in the year 1812, power-loom was first successfully operated in America.

At that date, a resident of Peacedale, Thomas R. Williams, invented a power-loom for weaving saddle-girths and other webbing; and here, *first* in the world's history, so far as is known, was successfully introduced an agency which, in its various applications, has effected an entire revolution in textile industries.

The name of the locality, also, seems to have been typical for the occurrence here of a phenomenon not so rare in Europe, but in this country almost without precedent,—that of the uninterrupted, prosperous succession in one family, for three generations of manufacturers, of an industry in the same place in which it was founded, and embracing seventy-six years of existence.

About 1800, Rowland Hazard here began the manufacture of yard-wide "linsey-woolsey," made with a white cotton warp and a wool filling, and colored black with logwood. The cotton came from Charleston, S. C., in small "pockets;" and all the operations—carding

* Signing Judge.

spinning, and weaving, both for warp and filling—were carried on by hand.

This fabric—an imitation of the old English stuff, which was made of linen and woollen, hence the name—commenced its long career of usefulness at this point, and was for a third of a century a leading article in the market. By its manufacture, it was made possible, for the first time in American history, that the female masses should be universally clothed; for, until this date, it was a common sight on the Providence plantations, as elsewhere in this country, owing to the poverty of the people, to see girls half grown up to womanhood with scarcely more covering than had the mother of the race.

About the year 1804, a set of carding-machines were started here by Joseph Congdon and John Warner Knowles, who soon sold out to Rowland Hazard. These early machines simply carded the wool into rolls, which were still put out to be spun by hand.

In 1814, Mr. Hazard purchased four of the power-looms referred to, of Mr. Williams, paying him three hundred dollars each; which, from date of purchase, were in successful operation.

In 1819, Isaac P. Hazard and Rowland G. Hazard, sons of Rowland, took charge at Peacedale, and, in the year following, started a spinning-jack of fifty-two spindles. The goods made were called kersey, and were still woven on hand-looms. Power-looms for wide goods were introduced in 1828. The manufacture of kersey was continued for a period of thirty-five years. In 1847, the Messrs. Hazard erected a mill for the making of fine wool; and, in 1848, they procured a charter for the Peacedale Manufacturing Company, of which Isaac P. Hazard was president, and Rowland G. Hazard was treasurer. Under this organization, the new mill began to turn out shawls, in 1849; the manufacture of which, in a large and saleable assortment, is continued to the present time.

Isaac P. Hazard retired in 1864, and Rowland G. Hazard in 1866; the latter leaving the business to the management of his sons, Rowland Hazard and John N. Hazard. In 1856, the works were greatly enlarged; and, in 1872, a new mill was added, for the manufacture of worsted goods. In this latter department, "Peacedale worsted coatings" have already attained a high reputation.

The company is now organized as follows:—

<i>President.</i>	<i>Treasurer.</i>
JOHN N. HAZARD.	ROWLAND HAZARD.
<i>Superintendent.</i>	<i>Clerk.</i>
DAVID HARROWER.	JOHN A. BROWN.

Offices at the works, Peacedale, and 27 Custom-House Street, Providence.

The capacity of the works are 14 sets 48-in. cards, 4 Noble combs, 98 wide looms, and 28 narrow looms; 350 hands employed.

AMERICAN PRINT WORKS, FALL RIVER, MASS.**A W A R D.****PRODUCT:** Printed Cotton Fabrics.

Commended for great variety and excellence in design and execution, in wide percales, in light styles, imitation seersuckers and ginghams, and shirting stripes, as well as in regular madder styles.

J U D G E S.

EDWARD ATKINSON.
HUGH WADDELL, Jr.
EDWARD RICHARDSON.
A. D. LOCKWOOD.
CHARLES H. WOLFF.
SAMUEL WEBBER.*
GEORGE O. BAKER.
ISAAC WATTS.

W. W. HULSE.
DON ALVARO DE LA GANDARA.
ARNOLD GOLDY.
GUSTAV HERRMANN.
JOSEPH DASSI.
MENI RODRIGUES DE VASCON-
CELLOS.

The American Print Works ranks among the oldest of the calico-printing establishments of this country. The original buildings were erected in 1834, and printing was commenced in January, 1835. The art of calico-printing was then in its infancy, and more than one-half of the styles then printed received but a portion of the colors by the machine, additional colors being blocked in by hand. Block-printing was entirely superseded by the use of printing-machines in 1847. The number of printing-machines in these works was, in 1835, four; in 1840, six; in 1868, sixteen; in 1876, twenty; with an increase in production from 90,000 yards per week in 1835, to 1,400,000 yards per week in 1877.

In addition to the above, this corporation bought, in 1858, the Bay State Print Works, situated one and a half miles south of their principal works, which has a capacity for producing 350,000 yards per week, making the total production of both works, when in full operation,

* Signing Judge.

1,750,000 yards per week, or about 90,000,000 yards per annum, equal to 6,000,000 dress-patterns of 15 yards each, being a total length of over 50,000 miles, or twice the circumference of the earth.

The principal enlargement of the American Print Works was made in 1867, when a portion of the old buildings were removed, and several large granite structures were erected, which were destroyed by fire, Dec. 15, 1867, but rebuilt, with additional improvements, in 1868. The main building, fronting on Water Street near the wharf of the Old Colony Steamboat Company, is a massive granite building, with a finely-proportioned tower and a mansard roof, presenting one of the finest fronts of any manufacturing establishment in the country. There are three parallel lines of buildings, with numerous Ls, the whole making a frontage, if placed in one line, of over 2,000 feet, with a total floor-surface of more than 10 acres. The cloths used in this establishment are made chiefly in mills near the print works, which are entirely separate corporations, but owned principally by the same proprietors.

The present capital stock of this corporation is \$1,000,000, divided into 10,000 shares of \$100 each.

The position of treasurer and general manager of the business of the American Print Works has been filled as follows:—

From 1834 to February, 1837, by HOLDER BORDEN.

From February, 1837, to February, 1876, by JEFFERSON BORDEN.

From February, 1876, to present time, by THOMAS J. BORDEN.

The goods produced cover a wide range of styles, of superior quality, including fine percales, cambrics, robes, shirtings, seersuckers, indigos, gingham checks, and fancy madder prints, and are supplied to the trade through their agents, Low, Harriman & Co., of New York; Shortridge, Borden & Co., of Philadelphia; and, in Boston, by their salesman, Mr. C. E. Lindsey, who visits that market from the works on alternate days.

EVERETT MILLS, LAWRENCE, MASS.

The United States Centennial Commission has examined the report of the judges, and accepted the following reasons, and decreed an award in conformity therewith.

REPORT ON AWARDS.

PRODUCT: Fancy Cottons, Cottonades, and Cheviots.

Name and address of Exhibitor:

EVERETT MILLS, LAWRENCE, MASS.

The undersigned, having examined the product herein described, respectfully recommends the same to the United States Centennial Commission for award, for the following reasons, viz. :—

Commended for excellence in subdued coloring, smoothness of fabrics, general good taste in design, of cheviot shirtings. Cottonades of very good quality.

A. GOLDY.

(Signature of the Judge.)

Approval of Group Judges.

EDWARD ATKINSON.
HUGH WADDELL, Jr.
EDWARD RICHARDSON.
A. D. LOCKWOOD.
CHARLES H. WOLFF.
SAMUEL WEBBER.
GEORGE O. BAKER.

ISAAC WATTS.
W. W. HULSE.
DON ALVARO DE LA GANDARA.
GUSTAV HERRMANN.
JOSEPH DASSI.
MENI RODRIGUES DE VASCONCELLOS.

A true copy of the record :

FRANCIS A. WALKER,
Chief of the Bureau of Awards.

Given by authority of the United States Centennial Commission.

A. T. GOSHORN, Director-General.
J. R. HAWLEY, President.

J. L. CAMPBELL, Secretary.

The Everett Mills of Lawrence, Mass., was chartered Feb. 2, 1860, with a capital of \$500,000; and, on the 15th of August of the same year, the capital was increased to \$700,000. The company purchased the real estate and buildings belonging to the Lawrence Machine Shop; and after making extensive alterations and additions to the various buildings, and the erection of new ones, they were filled with the necessary machinery for the manufacture of a general variety of colored fabrics. They commenced to manufacture goods on the 1st of January, 1861. On the 1st of December, 1862, the capital was still further increased to \$800,000. Their mills contain 32,096 spindles, 790 looms, and all of the requisite machinery for the manufacture of fancy goods. They also have extensive dye-houses and bleacheries for the same. The machinery is driven by turbine wheels of 600-horse power. The various products of the Everett Mills, consisting of cottonades, ticks, denims, cheviot shirtings, gingham, and an extensive variety of dress goods, are not surpassed by any goods in the market.

Messrs. GEORGE C. RICHARDSON & Co., 178 Devonshire Street, Boston, and 115 & 117 North Street, New York, are the company's selling agents.

The officers of the company are as follows:—

President.

JAMES LONGLEY.

Treasurer.

D. D. CROMBIE.

Clerk.

H. H. EDES.

Agent.

C. D. McDUFFIE.

Directors.

THOMAS WIGGLESWORTH.
JAMES ELLISON.
JOHN BIGELOW.
SAMUEL GOULD.

JAMES LONGLEY.
ABIJAH E. HILDRETH.
ISAAC D. FARNSWORTH.

MANCHESTER MILLS, MANCHESTER, N. H.**A W A R D.****PRODUCT: Stuff Dress Goods.**

Commended "for a very complete assortment of three-fourths figured dress goods, — mixtures, lustres, cashmeres, twills, and six-fourths cashmeres; all of excellent manufacture, color, and finish; at reasonable prices, and adapted for general consumption."

J U D G E S.**HENRY MITCHELL.*****THEODORE BOCHNER.****CHARLES LE BOUTILLIER.****AUGUST BEHMER.****JOHN L. HAYES.****CARL ARNBERG.****JOHN D. LANG.****ELLIOT C. COWDIN.****CHARLES J. ELLIS.****DR. MAX WEIGERT.****JOHN G. NEESER.****PRODUCT: Printed Calicoes.**

Commended "for variety and excellence in design and execution of madder prints, variety of styles, clearness of white, and especial excellence in aniline black grounds, in imitation of woven effects, with bright figures in madder colors, in pink and orange."

J U D G E S.**SAMUEL WEBBER.*****JOSEPH DASSI.****ARNOLD GOLDY.****GUSTAV HERRMANN.****EDWARD RICHARDSON.****EDWARD ATKINSON.****DON ALVARO DE LA GANDARA.****HUGH WADDELL, JR.****WILLIAM W. HULSE.****MENI RODRIGUES DE LA VAS-
CONCELLOS.****CHARLES H. WOLFF.****A. D. LOCKWOOD.****GEORGE O. BAKER.**

At Manchester, in New Hampshire, fifty-two miles from Boston, the Merrimack River falls about fifty feet, — the greatest fall at one point in its course. This fall gives a fine water-power, which has produced the flourishing city of Manchester, and sustains several large manufacturing companies. Prominent among these is the Manchester Mills, —

* Signing Judge.

a company incorporated in 1874, with a capital of \$2,000,000, for the manufacture of worsted dress goods and calicoes. This company exhibited its products at the Centennial Exhibition at Philadelphia; and the awards it there received (of which an abstract is given above) are the best proof of the quality of its work.

In the calico department,—for a part of the product cotton is bought in the bale, and passed through every process till it becomes gray cloth. This cloth is then taken up in the printery, bleached, and passed through every process till it becomes a finished print; which is packed in cases, and sent to market from the print-works. The mills, however, cannot make all the gray cloth required for the print-works; so that a large quantity is bought yearly to be printed with the cloth made by the company.

In the worsted department, all the warp is made from cotton bought in the bale, and all the woof from wool bought in the fleece. All processes are completed, and all the dyeing, finishing, and packing are done by the company, on its own premises, by its own workmen.

The following statistics, taken from an issue of 1876, give a good idea of the scale of the business of the company:—

Capital stock	\$2,000,000
Number of mills	6
Number of printeries	1
Number of cotton spindles	75,000
Number of worsted spindles	15,000
Number of looms	2,500
Number of printing machines	15
Number of females employed	1,860
Number of males employed	1,140
Pounds wool consumed per week	35,000
Pounds cotton consumed per week	80,000
Yards cloth made per week	550,000
Yards cloth printed per week	1,000,000
Yards dyed per annum	12,500,000
Yards printed per annum	40,000,000
Tons coal used per annum	15,000
Cords wood used per annum	1,000
Gallons oil used per annum	13,000
Pounds starch used per annum	125,000
Drugs used per annum	\$500,000
Water-wheels used, 3 eight-feet, 1 four-feet, 1 seven-feet in diameter.	
Aggregate horse-power	2,000
Monthly pay roll	\$95,000

The company makes large provision of houses (usually of brick) for its workpeople, suitably divided into boarding-houses and private homes. The city is well supplied with public libraries, free schools, and churches; is well governed and orderly, enjoys a peculiarly pure and healthy air, and ranks high among the manufacturing towns of the United States for the advantages it secures to its operatives and other residents.

President.

LYMAN NICHOLS.

Directors.

WILLIAM H. HILL.
BENJAMIN P. CHENEY.
WILLIAM O. GROVER.

SAMUEL R. PAYSON.
SAMUEL FAY.
MOODY CURRIER.

Treasurer.

JOHN C. PALFREY.

Clerk.

ASA FOWLER.

Agents.

JOSEPH STONE.

BENJAMIN C. DEAN.

Selling Agents.

WHITE, PAYSON, & Co., Boston, New York, and Philadelphia.

CONTINENTAL MILLS, LEWISTON, ME.

A W A R D.

PRODUCT: Cotton Fabrics.

Commended for unusually firm, pure, and well-manufactured medium fabrics.

J U D G E S.

EDWARD ATKINSON.
HUGH WADDELL, Jr.
EDWARD RICHARDSON.
A. D. LOCKWOOD.
CHARLES H. WOLFF.
SAMUEL WEBBER.
GEORGE O. BAKER.
ISAAC WATTS.*

W. W. HULSE.
DON ALVARO DE LA GANDARA.
ARNOLD GOLDY.
GUSTAV HERRMANN.
JOSEPH DASSI.
MENI RODRIGUES DE VASCON-
CELLOS.

C L A I M.

The power that drives the Continental Mill is 1,200-horse. The estimates show that the daily difference in favor of water-power at Lewiston, as compared with steam-power, is 21.19 cents in favor of the former. This result makes a good showing in one very important item of the cost of manufacture at the "Continental." The exclusive manufactures here are sheetings and shirtings; consuming 13,000 bales of cotton per annum, or about 6,000,000 pounds, producing 15,000,000 yards of cloth annually, in 36 and 40 inch goods; the chief staples being known to the trade as "Continental C's and D's." The Continental C is 36 inches wide, and $3\frac{1}{2}$ yards to the pound; the D is 40 inches, and 3.12 to the pound; both pure cotton, nothing of foreign substance entering into the fabrics of the Continental, except the sizing of starch,—a proportion of less than three per cent. The

* Signing Judge.

products of the Continental Mill are in high favor, not only at home, but in the English market also; coming into the same use in Great Britain that it has won here, in prime favor among buyers, who wish the utmost value of their money in pure cotton fabrics. There are none better in the world than those of the Continental Mill; and it is certain they are as staple in Manchester and London as in New York and Boston.

ACTIEN-GESELLSCHAFT FÜR ANILIN-FABRIKATION, BERLIN, GERMANY.

A W A R D.

PRODUCT: Coal-Tar Products and Aniline Colors.

For fineness of collection of novel, various, and pure coal-tar colors, and for the successful application, on a large manufacturing scale, of Coupier's process for the production of aniline without the use of arsenic acid or other mineral oxygeant.

J U D G E S.

Prof. C. A. JOY.	Dr. WILLIAM ODLING.
Prof. F. A. GEUTH.	Dr. R. VAN WAGNER.
Prof. J. LAWRENCE SMITH.	J. F. KUHLMAN, Jr.
Prof. C. F. CHANDLER.	PROSPER DE WILDE.
Prof. J. W. MALLET.	EMANUEL PATERNO.

The title of this company, as above, means "Stock Company for Manufacturing Anilines." There are two large establishments, erected on about nineteen acres:—

1. Works at Rummelsburg, near Berlin, for benzole, nitro-benzole, aniline oil, methyle-aniline, and nitric acid.
2. Works at Wiesenufer, near Berlin, for all kinds of aniline colors, spirits of ammonia, and iron vitriol.

The works employ 7 steam-engines, of about 60-horse power; 9 steam-boilers, 5 chemists, and some 150 workmen and officials.

The works at Rummelsburg, established in 1868, produce daily about:—

Refined benzole	3,000 lbs.
Nitro-benzole	3,700 „
Aniline	2,000 „
Methyle-aniline	300 „
Nitric acid	3,500 „
Mirbane oil	200 „

Besides naphthylamine, diphenylamine, phenylendiamine, in quantities.

The establishment was the first to produce in Germany methyle-aniline in large quantities. Two-thirds of the production is consumed by the Wiesenufer works, balance being sold to other aniline manufacturers, and to calico printers.

The establishment at Wiesenufer was, in 1872, greatly enlarged and improved; it now produces daily about 1,000 lbs. aniline colors. Consumers of aniline products will find great advantages in our products. The proprietors are chemists, who have been connected with the manufacture of aniline products since their discovery. Many of the more prominent colors bear their names as discoverers; Rubine, and Rosaniline, which is the base of many of the finest reds and blues, &c., are prepared in so pure a state that they are largely in demand by aniline-color manufacturers. Not only is a very careful attention paid to the purity of manufacture, but an important feature in our products are the novelties in shades; it being the aim of the company not only to produce, in the largest way, the pure regular products, but the novelties demanded by caprice of fashion. The company have paid much attention, also, to adapting their colors to use on leather, skins, paper, inks, dressings, &c., and with great success.

Henry A. Gould, 101 Milk Street, Boston, is their American agent; and, being among the first to introduce aniline colors into the United States, with his previous connection with other European makers, is well able to attend to their rapidly increasing business.

The great success of this company in a few years proves that a pure article, standard well maintained, will in time take the lead, despite competition. Large consumers will be offered liberal terms.

W. J. Matheson, 16 Cedar Street, New York (formerly with New York agency of A. Poirrier, Paris), has been engaged to attend to the wants centering there.

**MILLER'S BIBLE AND PUBLISHING HOUSE,
PHILADELPHIA, PA.**

A W A R D .

PRODUCT: Bibles.

Commended as an exhibition of superbly bound Bibles, showing great taste and skill in the highest styles of the bookbinder's art.

J U D G E S .

JAMES M. WILCOX.
C. O. CHAPIN.
WILLIAM FAXON.
EDWARD CONLEY.

H. T. BRIAN.
Sir SYDNEY H. WATERLOW.
G. W. SEITZ.

C L A I M .

Edward W. Miller's Bible and Publishing House, 1102 and 1104 Sansom Street, Philadelphia, was established in 1831; and is believed to be one of the oldest in the United States, having a continuous existence under the same management. The editions emanating from this house have attained a wide popularity throughout the country, and several of the most prominent and pro-perous subscription houses (principally of that city) have received their supplies from this establishment. Their popular "Family Bible" is claimed to be the cheapest and best subscription book ever offered to the public. The manufacture of Bibles has ever been a specialty; and the most approved machinery is to be found in the press-room,—all the appliances being on a heavy scale, and operated by steam-power. In addition to Bibles, the proprietor commenced, in 1835, the publication of the "Southern Harmony;" a book of music, by William Walker, of which the many editions have reached 500,000 copies. The "Christian Harmony" is another popular music-book, by the same author; first issued in 1867,

and has met with similar success, — the sales increasing now every year. The proprietor is a practical bookbinder, who commenced that business forty-five years ago, and has prosecuted it with persevering industry and success ever since. About 1841, he associated with him Samuel D. Burlock, — one of his journeymen; and the business was carried on under the name of Miller & Burlock for twenty-three years, when it was dissolved. In 1871, he admitted his son, Francis H. Miller, to an interest in the business; and, in 1875, another son. Alfred W., also became associated with him in the affairs of the house; it being his intention to educate them thoroughly in the several departments before he withdraws from active pursuits, when they will take the management of affairs exclusively under their own control. The success that has attended the business has been due to the strict integrity and honorable dealing of the proprietor, and to the superior quality and moderate prices of his goods.

AUB, HACKENBURG & CO., PHILADELPHIA, PA.

A W A R D .

PRODUCT: Machine and Sewing Silks, and Button-Hole Twist.

A fine exhibit of sewing and embroidery silks and machine twist; the sewing and embroidery silks principally meritorious for great beauty and brilliancy of color; the button-hole twist and saddlers' silk highly commendable.

J U D G E S .

JOHN L. HAYES.
ELLIOT C. COWDIN.
CHARLES LE BOUTILLIER.*
CHARLES J. ELLIS.
J. D. LANG.
CONSUL GUSTAV GEBHARD.
THEODORE BOCHNER, Jr.
HENRY MITCHELL.

Dr. MAX WEIGERT.
LOUIS CHATEL.
CARL ARNBERG.
HAYAMI KENZO.
JOHN G. NEESER.
AUGUST BEHMER.
ALBERT DANINOS.

C L A I M .

Commenced business in 1863. Have established a standard of best qualities of machine and sewing silks, and button-hole twist, especially for shoe and clothing manufacturers. Their goods are known to the trade as reliable, honest, and first-class; being made of best stock, and strictly pure dye, which they were the first to introduce in the United States, as also the system of weighing each box of silk before delivering to customers. Their goods are always sold with their own name on, and received the only prize for machine and sewing silk — a silver medal, after having been thoroughly tested by competent judges — at Franklin Institute Exhibition, Philadelphia, 1874, “for superiority in every respect;” and the medal and diplomas, as above, at the Centennial Exposition. Their factory is at 244, 246, and 248 North Front Street, Philadelphia.

Sales-rooms at 20 North Third Street, Philadelphia; 265 West Baltimore Street, Baltimore; 69 West Third Street, Cincinnati.

* Signing Judge.

CHENEY BROTHERS, HARTFORD AND SOUTH MAN- CHESTER, CONN.

A W A R D.

PRODUCT: Silk and Silk Ribbons.

Commended for perfect manipulation of spun silk in every form, and for piece goods and ribbons manufactured thereof, evincing a high degree of excellence.

J U D G E S.

JOHN L. HAYES.
ELLIOT C. COWDIN.*
CHARLES LE BOUTILLIER.
CHARLES J. ELLIS.
J. D. LANG.
CONSUL GUSTAV GEBHARD.
THEODORE BOCHNER, Jr.
HENRY MITCHELL.

Dr. MAX WEIGERT.
LOUIS CHATEL.
CARL ARNBERG.
HAYAMI KENZO.
JOHN G. NEESER.
AUGUST BEHMER.
ALBERT DANINOS.

CHENEY BROTHERS, Silk Manufacturers, South Manchester and
Hartford, Conn.

(Established 1836.)

Cheney Brothers have been identified with the silk industry of America for nearly forty years.

They began by trying to establish the culture of silk in this country, and only after this proved to be a failure did they become silk manufacturers.

They were for a long time the leading manufacturers of sewing silks and machine twist; but of late years they have devoted themselves to various branches of weaving, and have produced some spe-

* Signing Judge.

cialties in spun-silk fabrics which are better than any goods of the same class made in Europe.

At the Centennial Exposition, they claimed for their spun silks and spun-silk fabrics superior excellence, and received an award from the judges for them.

Among the leading articles produced in this establishment are black and colored gros-grain silks, which have obtained a wide-spread reputation for their good wearing qualities and cheapness, as compared with imported goods of corresponding grades and weight.

Ribbons of all colors and widths have of late been extensively made here, and have become the best known and most popular standard brands on the market.

A great variety of light silks are woven for the millinery and trimming trade,—for parasols, and for hat and fur linings.

An important part of their business is supplying other manufacturers with materials in silk used by them, both in the yarn and woven fabrics, to be cut up for various purposes.

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BELDING BROTHERS & CO., ROCKVILL, CONN.**A W A R D.****PRODUCT : Sewing Silks.**

Machine and sewing silks, of good color, strength, smoothness, and quality.

J U D G E S.

JOHN L. HAYES.
 ELLIOT C. COWDIN.
 CHARLES LE BOUTILLIER.*
 CHARLES J. ELLIS.
 J. D. LANG.
 CONSUL GUSTAV GEBHARD.
 THEODORE BOCHNER, Jr.
 HENRY MITCHELL.

Dr. MAX WEIGERT.
 LOUIS CHATEL.
 CARL ARNBERG.
 HAYAMI KENZO.
 JOHN G NEESER.
 AUGUST BEHMER.
 ALBERT DANINOS.

C L A I M.

It has been well said, that the history of a country is the history of its great men ; and, in like manner, it may be said that the history of any trade is the history of the leading merchants and manufacturers in that trade.

In giving some account, therefore, of the rise of the firm of Belding Bros. & Co.,—one of the leading firms manufacturing sewing silks,—we illustrate the rapid and enormous growth of that particular branch of manufacture.

In the year 1856, Mr. M. M. Belding (now the head of this firm), at that time a boy at school in his native village of Ashfield, Mass., with the praiseworthy idea of making his vacation profitable, invested \$25, which was advanced to him by an uncle, in skein silk,—but little machine twist being used at that time. In the first week, he made \$9, selling the silk from house to house ; and, thus finding his little venture profitable, he was encouraged to go on with it. By this means he built up a connection, and acquired a knowledge of silk ; so that when, in 1858, his father left Ashfield, and took the rest of his family to Otisco, Michigan, M. M. Belding stayed behind, determined to make sewing-silk the business of his life. He then sent out to his brothers in Michigan sewing silk to the amount of \$150. And with this, and a cash capital of \$3.15,—all they could raise,—H. H. and A. N. Belding started out. They were very successful in selling ; and, before long, were obliged to buy a horse and buggy to go their rounds. They then began to sell wholesale to country merchants,—their brother still remaining in Massachusetts, and buying the silk as it was wanted.

* Signing Judge.

But they had made such an extensive business connection in the West that it became necessary to have some more suitable headquarters than a small country village; and accordingly, in September, 1863, M. M. Belding went to Chicago, and started the wholesale house of Belding Bros. & Co. They were at this time buying their silk from different manufacturers; but they sold so many goods that they thought it advisable to connect themselves with some manufacturer; and accordingly, in January, 1864, they bought a three-quarter interest in a little mill at Rockville, Connecticut, employing only twelve girls, and with two winders, two spinners, and four spoolers, as the sum total of their machinery. This interest they retained for three years, the business in the mean time constantly increasing; and finally, in the fall of 1866, they built, at a cost of \$117,000, the magnificent mill at Rockville, which they are now operating.

This mill, which is under the charge of Mr. A. N. Belding, is a substantial brick building, 125 by 44 feet, of four stories and basement; with dye-house and boiler-house in the rear, 50 feet square, with an L 60 by 24 feet. The raw silk when it comes in is carefully sorted, — an operation upon which the future of the silk in a great measure depends. It is then soaked for some time in soap suds and warm water to soften it, so that it can be worked properly. It is then wound on to large spools. The next operation is the cleaning, which is done on the top floor. This consists in passing the silk between two small adjustable steel knives, which clear it of any little knots and imperfections. This is not done in every mill, and adds to the quality of the silk manufactured by this firm. The silk is then doubled. This consists in winding on to a spool from three to thirty threads of silk, according to the purpose for which it is intended. It is then spun, and wound on to iron bobbins, when it is taken to the basement and matched; that is doubled, three times for machine twist, and twice for sewing silk. It is then twisted, and afterwards stretched by a machine, which deserves something more than a passing notice. The iron bobbins are placed on a rod in a trough of cold water, and the silk wound on to a revolving cylinder. From this cylinder the silk is wound on to another cylinder, revolving at a greater rate of speed. This has the effect of stretching the thread about fifteen per cent, and making it even throughout. The patent for the stretching-machine, which is one of the most valuable of those employed in a silk-mill, is largely owned by Belding Bros. & Co., who have sold the right to use it to a number of manufacturers. It is then reeled into skeins of 350 yards each, and dried in a steam drying-room; after which it is taken to the dye-house, where it is boiled about four hours in soap and water, in order to take out the gum. By this operation, it loses about twenty-five per cent of its weight. It is then dyed. And here it is that Belding Bros. have made a reputation for themselves by their pure-dye silks. There is a great deal of sewing silk sold which is weighted up to 100 per cent; but all silk that goes out of this factory, with the name of Belding Bros. & Co. on it, is made with the purest dye it is possible to get.

Their shaded embroidery, also, is the best that is made, as they use a

somewhat better silk for that purpose than the generality of manufacturers. They have made no less than 500 shades and colors, and it would seem as if it were impossible to go beyond this.

The silk is then taken upstairs, parted off into 350-yard skeins, when it is sized and lettered. This is done by placing each skein on a balance, which indicates the size of thread and letter to which each skein belongs. Belding Bros. & Co. number their silk from 000, for the finest white, running 3,000 yards to the ounce, to the coarsest black, FF, only 210 yards to the ounce.

It is then wound on to spools, ready for market, by spooling machines, from 10 to 3,000 yards on a spool. To each spooler a self-indicating measuring machine is attached, so that the exact length of silk on every spool is known. The same is the case with the weight. Each girl who runs a spooler has a set of scales graduated to $\frac{1}{16}$ of an ounce, on which she first weighs each dozen empty spools, and then the same when full. Thus Belding Bros. & Co. know the weight of every dozen spools of silk that go out of their factory, and can guarantee it.

To give some idea of the amount of work done in this factory alone, we would state, that Belding Bros. & Co. have in use 45 winders, 44 cleaners, 24 doublers, 62 spinning-frames, 10 stretchers, 11 reels, 15 soft-silk winders, and 104 spooling-machines.

But the amount of sewing silk manufactured in this mill could not supply the demand for the goods of Belding Bros. & Co., which the different members of the firm and their agents had been pushing through their different houses all over the United States and Canada, at the following points: New York, where M. M. Belding resides; Chicago, under H. H. Belding; Cincinnati, under D. W. Belding and W. A. Stanton; Philadelphia, where they are represented by L. C. Hall, Jr., & Co.; St. Louis, Boston, San Francisco; and Montreal, where the firm have established a branch house, and started a mill under the supervision of Mr. C. F. Lockhart, the reputation of and sale for the goods of this firm in Canada being sufficient to warrant them in taking such a bold step.

For the last seven years, they have been stocking a mill at Williamantic, and another at Mansfield, Conn.; and, in 1876, bought a mill at Northampton, Mass., which they have filled with the newest and best machinery that can be made, for the purpose of manufacturing sewing silk.

To give some idea of their enormous business, we would state, that Belding Bros. & Co. use no less than 3,000 pounds a week of the raw material, and give employment, directly and indirectly, to 1,000 hands; while their sales last year were about \$1,500,000,—a great advance from the \$1,000 sold in 1856.

Messrs. Belding Bros. & Co. were the first American manufacturers to put their own names on their best goods; and their doing so has, no doubt, been a great aid to the reputation their goods have obtained. At the same time, in no instance where they have exhibited their silk in competition have they failed to obtain the first premium.

F. STEFFAN & CO., PHILADELPHIA, PA.

A W A R D.

PRODUCT: Shawls.

Reversible beaver shawls, of wool filling and cotton warp, noticeable for originality and taste of design, of gray and black stripes, with borders woven in the Jacquard loom.

J U D G E S.

JOHN L. HAYES.
 ELLIOT C. COWDIN.
 CHARLES LE BOUTILLIER.
 CHARLES J. ELLIS.
 J. D. LANG.
 CONSUL GUSTAV GEBHARD.
 THEODORE BOCHNER, Jr.
 HENRY MITCHELL.

DR. MAX WEIGERT.*
 LOUIS CHATEL.
 CARL ARNBERG.
 HAYAMI KENZO.
 JOHN G. NEESER.
 AUGUST BEHMER.
 ALBERT DANINOS.

C L A I M.

The exhibit for which we have received the above award was composed of goods daily produced at our factory, and not manufactured for the occasion. We believe they are not surpassed by those of any other manufacture. We are now making a specialty of woollen and worsted shawls, worsted cloakings, coatings, dress goods, &c. ; the manufacture of which we have carried to high perfection.

The operations at our mill have always been carried out under our personal supervision ; and we have, from time to time, introduced the improvements and machinery needed to keep our goods up to the standard of the times.

We have the ability and working capacity to produce work, as we believe unsurpassed in America for excellence of material, beauty of finish, and durability.

Our mill has a frontage of 60 feet on Front Street, 100 feet on Hope Street ; is 150 feet deep, and four stories in height, exclusive of basement ; and gives employment to two hundred hands.

* Signing Judge.

SEFFARLEN & FRITZ, PHILADELPHIA, PA.**A W A R D.****PRODUCT: Rag-Carpet Yarns.**

An excellent exhibit of wool and cotton rag-carpet yarns; the wool made from carpet noils, in a great variety of shades,—the solferino, pink, and orange, especially noteworthy.

J U D G E S.**JOHN L. HAYES.****ELLIOT C. COWDIN.****CHARLES LE BOUTILLIER.****CHARLES J. ELLIS.*****J. D. LANG.****CONSUL GUSTAV GEBHARD.****THEODORE BOCHNER, Jr.****HENRY MITCHELL.****DR. MAX WEIGERT.****LOUIS CHATEL.****CARL ARNBERG.****HAYAMI KENZO.****JOHN G. NEESER.****AUGUST BEHMER.****ALBERT DANINOS.**

From small beginnings, up to our present extended business, our industry has been developed during the past twelve years. Both members of our house are practical and experienced in the business, and personally superintend the workings of our entire establishment, giving due regard to the best interests of our patrons. Most of the parties engaged in the business act only as jobbers, securing their merchandise from outside sources, and reselling to the country trade. While the entire list of goods sold by us are of our own make, showing twenty-seven different colors in cotton-chain, thirty-six different shades and colors in wool, and nine different colors in linen. We also manufacture cotton batting, from the lowest to the highest grade; cotton and hemp twines, from the coarsest to the finest quality; wickings of all descriptions; cotton yarns, from the coarsest number to the finest yarn used in the manufacture of cloth.

We make a specialty of coloring, under the supervision of skilled workmen, with facilities for dyeing 4,000 pounds of yarn per day.

We received at the Centennial the only prize medal awarded for goods in our line.

* Signing Judge.

ROXBURY CARPET COMPANY, BOSTON, MASS.

A W A R D.

PRODUCT: Tapestry and Velvet Carpets.

A superior exhibit of tapestry, Brussels, and tapestry velvet carpets, of high excellence in texture, color, and original design; the pile conspicuous for its length, indicating good wearing qualities.

J U D G E S.

JOHN L. HAYES.*
ELLIOT C. COWDIN.
CHARLES LE BOUTILLIER.
CHARLES J. ELLIS.
J. D. LANG.
CONSUL GUSTAV GEBHARD.
THEODORE BOCHNER, Jr.
HENRY MITCHELL.

DR. MAX WEIGERT.
LOUIS CHATEL.
CARL ARNBERG.
HAYAMI KENZO.
JOHN G. NEESER.
AUGUST BEHMER.
ALBERT DANINOS.

ROXBURY CARPET COMPANY.

Office, 7½ Beacon Street, Boston.

M. H. SIMPSON. *Agent.*J. W. BLAKE, *Treasurer.*

Tapestry carpets, known as tapestry Brussels and tapestry velvets, form a very important branch of the carpet manufacture of the United States. This style of carpet, of quite recent invention, is particularly adapted to the popular demand for brilliant effects at moderate prices; for there is no form of carpet in which so good an appearance can be secured at so low a cost. In all other carpets the yarns are dyed. The principle of the fabrication of these carpets consists in *printing* the colors upon the warps in such a manner that, when the warps are woven, they form the desired figure. In this style of carpet the room for the application of color and design is unlimited, and certainly gives the best appearance for the least money.

The method of printing the warp, which constitutes the essential feature of the tapestry carpets, was the invention of a Mr. Whitock,

* Signing Judge.

of Edinburgh, Scotland, about 1838. In 1846, Mr. John Johnson, an Englishman, educated in Crossley's establishment, and who had himself put up the first machinery for this branch of fabrication, at Halifax, England, the site of the Crossley works, came to this country, and established the manufacture of tapestry carpets, at Newark, New Jersey; running about twenty-five hand-loom. He was facilitated in his enterprise here by the fact that Whitock had taken out no patents in this country. Mr. Johnson subsequently removed his establishment to Troy, N. Y., where the manufacture was carried on for two or three years under his direction, though not in his name. In the fall of 1855, the machinery was purchased by a company, of which Mr. M. H. Simpson was the principal stockholder, and was removed to Roxbury, Mass., in 1856.

The great experience of Mr. Johnson, and the inventive powers of Mr. Simpson and Mr. Johnson, have secured for the Roxbury Carpet Company's goods great prominence in the market, as was shown by their exhibit at the late Exposition. Their tapestries are in no sense inferior to those of Crossley's, the leading manufacturer of Europe, in this line of goods.

When this class of goods was first put on the market here, the experience was the same as in Europe: they met with but little favor. But there has been a growing appreciation and demand for them, until now they are the leading goods in the trade. One of the greatest advantages in their favor, with consumers, is the fact that all colors can be freely used; and so the most pleasing effects are secured, while the expense is kept far below that of other styles of manufacture.

The progress made here since the first introduction is remarkable. The product of the first hand-loom was but five yards per loom per day. In 1856, the product of this company, for each loom per day, was sixteen yards. At present, the average product of each of the 114 looms employed is $49\frac{1}{2}$ yards per day. The ratio of price for Brussels is \$1.85; for tapestry, \$1.00. Five hundred and fifty hands are employed, and their entire production finds its consumption in American homes; a valuable comment on the excellence of the manufacture, and a fact of great social significance.

BURLINGTON WOOLLEN CO., WINOOSKI FALLS, VT.

A W A R D.

PRODUCT: Cassimeres and Overcoatings.

A good exhibit of elysians, black and colored; Moscows, kerseys, and castors; also, 3-4 black doeskins, of superior finish and color.

J U D G E S.

JOHN L. HAYES.
ELLIOT C. COWDIN.
CHARLES LE BOUTILLIER.
CHARLES J. ELLIS.*
J. D. LANG.
CONSUL GUSTAV GEBHARD.
THEODORE BOCHNER, JR.
HENRY MITCHELL.

Dr. MAX WEIGERT.
LOUIS CHATEL.
CARL ARNBERG.
HAYAMI KENZO.
JOHN G. NEESER.
AUGUST BEHMER.
ALBERT DANINOS.

The Burlington Woollen Company's Mills at Winooski Falls, Vermont, are the largest and best known mills in the State, and their reputation is second to none for the superior quality and styles of their goods; the fabrics produced by these mills having continued to improve until now many are preferred to the foreign makes of same kinds.

The mills were erected in 1836 to 1838, and their early history was one of almost unbroken defeat, until in 1852, when they passed into new hands; and from them, in the fall of 1862, into the control of the present corporation, under whose management their capacity has been nearly doubled, and their success secured.

These mills were the first to introduce the manufacture of *Moscows* into this country as they are now made, and the production of which has increased many fold. They are also celebrated for their fine and medium *broadcloths*, of permanent color, and elegant and durable finish. *Doeskins* and *Moscow* beavers have been leading articles of manufacture, and have a high reputation with the trade.

Within the last year or two, rapid strides have been made in the manufacture of *fine figured and fancy cassimeres and suitings*; which, until now, have always been imported from England and France; but this company's productions of them have proved in every way equal to the foreign articles, not only in durability, but also in permanence of color, beauty of fabric, and fineness of finish; and they are rapidly and surely displacing the foreign makes, with full satisfaction to the consumers, who are beginning to realize that as good fabrics can be produced in this country as anywhere in the world.

The value of the annual product is about \$1,000,000, and the wool consumed rather less than 1,500,000 pounds.

Mr. Joseph Sawyer is the Treasurer; and Mr. Frederick C. Kennedy, the Agent and Secretary; Hon. E. R. Mudge being the President.

The Selling Agents are Messrs. E. R. Mudge, Sawyer, & Co., of Boston, New York, and Philadelphia.

* Signing Judge.

GEORGE CROMPTON, WORCESTER, MASS.

A W A R D .

PRODUCT: Looms.

The best looms for fancy weaving on shawls, cassimeres, and satinets ; embracing original inventions, ingenious construction, and excellent workmanship.

J U D G E S .

JOHN L. HAYES.
ELLIOT C. COWDIN.
CHARLES LE BOUTILLIER.
CHARLES J. ELLIS.
J. D. LANG.
CONSUL GUSTAV GEBHARD.
THEODORE BOCHNER, Jr.
HENRY MITCHELL.

Dr. MAX WEIGERT.*
LOUIS CHATEL.
CARL ARNBERG.
HAYAMI KENZO.
JOHN G. NEESER.
AUGUST BEHMER.
ALBERT DANINOS.

C L A I M .

The looms made at the works have never been exhibited in competition excepting at Paris, in the Universal Exposition of 1867. There the Broad Woollen Loom, "Improved Upright Lever," was in constant operation, and attracted the earnest attention of the Continental manufacturers. It was awarded a silver medal ; being the *only* recognition given to any loom for weaving woollens, notwithstanding seven different looms were in competition, from England, Saxony, France, Belgium, and Prussia. It is now largely in use on the Continent of Europe.

Since completing improvements upon the harness-motion of the loom shown at Paris, we have produced a new and entirely unique harness-motion, styled the "Horizontal Harness-Motion." The choice between these two looms is very little ; the weaving community being about equally divided in opinion as to their merits.

Within a short time, improvements have been made in motions for

* Signing Judge.

operating shuttle-boxes; also, in devices for finding the pick, when broken or exhausted.

Great improvements have been made in looms designed for weaving cotton and worsted goods (dress goods, &c.). The improvements made are those of the harness and shuttle-box mechanisms and stop-motions, having for their object the highest attainable speed.

We exhibited looms at the "International," as follows: The Broad Woollen Loom; the Broad Loom; a narrow Loom with new box-motion and power pick-finder; the Gingham Looms, with four shuttle-boxes at one end, and four at each end, which are the standard looms of the country for ginghams; and the Chain Tappett Loom, a new departure in the way of a harness-movement, and which, for simplicity, durability, cheapness, and speed, so far as its capacity extends, promises to successfully rival all that is known at this period.

We did not exhibit the ordinary Cam Loom, Tape, Brussels Carpet, Silk Looms, &c., and many others, of which we have patterns; being content to show the leading types in woollen and cotton weaving, in which we have the largest experience and reputation.

The most of the looms constructed by us at this date are "close shed." There is much said, in certain quarters, as to the superior advantages of the "open-shed" looms. Ten years ago, in a catalogue of the looms we were then constructing, some of which were open-shed, we said, "For *general* use, experience shows that the 'open shed,' though fascinating in theory, is not without faults in practice." Much experience since in manufacture and use has confirmed us in the opinion our judgment was correct and will stand; though what we then dropped as in the nature of things faulty has since been adopted by others, with some flourish of trumpets, as original, and a great improvement.

Fancy woven goods comprise three-quarters of all the cloths made at the present day. The origin of these goods, and the agency of the Crompton Loom in their early manufacture and present continued popularity, is thus stated in the official report of the judges on wool fabrics, Group Nine, at the late International Exhibition:—

"In 1834, M. Bonjean, a prominent wool manufacturer in Sedan, France, and an élève of the Polytechnic School, conceived the idea of modifying the plain cloths, hitherto universally made, by uniting upon the same stuff different tints or patterns of tissue. This he was able to effect by the Jacquard Loom. It was evident that the variety of stuffs which could thus be made was as unlimited as the fancy of the manufacturer. Hence he styled his woollens 'fancy' cassimeres.

These cloths, put on the market and exposed at public expositions, instantly struck the popular taste, and were imitated,—at first in France, and then in all other manufacturing nations. Their introduction into this country is an illustration of the benefits flowing from national expositions.

“In 1840, an American gentleman, arriving directly from Paris, visited Mr. Samuel Lawrence, then agent of the Middlesex Mills, at Lowell, Mass. In the words of Mr. Lawrence, ‘He had an overcoat woven in diamond figures of great beauty; said he saw it at an Exposition in Paris; and Bonjean & Son, of Sedan, were the manufacturers. He gave me a small bit from the inside of the collar.’

“With this bit, as an example of what was to be done, Mr. Lawrence applied to Mr. William Crompton to adapt machinery for this tissue already devised by him for cotton fabrics; and the result was the introduction of the ‘Crompton Loom;’ upon which fancy cassimeres have since been woven, not only in this country, but in Sweden, Germany, Austria, and Belgium.”

In a report by another board of judges, at the International Exposition, that of Group Eight, upon Textile Machinery, those gentlemen say, “The original and well-known Crompton Loom has been modified and improved from time to time, by the successive inventions of George Crompton, since the year 1854, until it covers a wide range of figured or ‘fancy woven fabrics;’ and is a *thoroughly well built, reliable, and adaptable machine.*”

The first of these reports was written by an American, and the other by an Englishman; both eminent in their respective localities and professions.

Their united, harmonious testimony, together with the above award of the Commission, giving the rank of the Crompton Loom as the “Best,” is very impressive in its sweeping commendation.

ALEXANDER SMITH & SONS' CARPET COMPANY, YONKERS, N. Y.

A W A R D.

PRODUCT: Carpets.

For a beautiful display of Axminster and tapestry Brussels, and tapestry velvet carpets, the latter excellent in texture and design; the Axminster carpets distinguished for great beauty of design, color, and texture, and remarkable as made by original automatic machinery, introduced by the senior exhibitor.

J U D G E S.

JOHN L. HAYES.
ELLIOT C. COWDIN.
CHARLES J. ELLIS.
J. D. LANG.
CONSUL GUSTAV GEBHARD.
THEODORE BOCHNER, Jr.
HENRY MITCHELL.
CHARLES LE BOUTILLIER.

Dr. MAX WEIGERT.*
LOUIS CHATEL.
CARL ARNBERG.
JOHN G. NEESER.
HAYAMI KENZO.
AUGUST BEHMER.
ALBERT DANINOS.

The Alexander Smith & Sons' Carpet Company's works are located in the city of Yonkers, in the State of New York, and were incorporated in 1874; being a continuation of the business of Alex. Smith & Sons, which was established by Alex. Smith some twenty years previous, for the manufacture of ingrain carpeting; who was the first to manufacture two-ply ingrain carpeting by the use of parti-colored warp and weft, known as tapestry ingrain, and also the first to adopt original automatic machinery, operated by power, for the weaving of Axminster carpeting, whereby one person can produce as many yards of goods as was formerly produced, of similar fabric, by twelve persons by the usual hand-loom operation. The perfecting of this loom required years of experimenting, encountering difficulties which seemed at times to be almost insurmountable; but, with patience and determination, the invention has been brought to a state of perfection that places it at the front in mechanical appliances for the manufacture of carpet-

* Signing Judge.

ing ; giving all desirable scope for design, and unlimited in the use of variety in coloring ; producing a fabric unequalled for beauty and durability by any carpeting manufactured, except the most costly kinds manufactured in Europe by the slow process of hand operation. Previous to the introduction of this invention, it was impossible to compete in this country with the foreign manufacturer, as the cost for labor in weaving constituted a very large proportion of the cost in manufacturing ; whereas we now have thirty-four of these looms in operation, capable of producing 700 yards per day, and of supplying most of our people who desire a fine carpet of this description, at moderate price, without depending upon European productions.

The Alexander Smith & Sons' Carpet Company have 34 Axminster looms, producing 700 yards per day ; 100 tapestry Brussels looms, producing 5,500 yards per day ; and 138 ingrain looms, producing 2,000 yards per day ; with all the carding, spinning, and printing machinery necessary for preparing the wool for the looms, of the latest and most approved kinds ; giving employment to twelve hundred operatives.

All the principal buildings are new and substantial, of ample capacity for the purposes intended, located on a stream of very pure water ; and we take pleasure in believing that our establishment is not excelled by any in its appointments and arrangements for the manufacture of carpeting : and are especially gratified in knowing that we were the first to successfully establish the manufacture of a class of fine carpeting by power-loom, never before attempted in this or any other country ; and that, by the employment of superior artisans in the various departments, the production of our looms will not suffer by comparison with any goods manufactured of similar description.

OFFICERS.

ALEXANDER SMITH . . . *President.*
 WARREN B. SMITH . . . *Treasurer.*
 WM. F. COCHRAN . . . *Secretary.*
 W. & J. SLOANE . . . *Agents, No. 655 Broadway, N. Y.*

WASHINGTON MILLS, E. B. MUDGE, SAWYER, & CO., LAWRENCE, MASS.

A W A R D.

PRODUCT: Worsted and Stuff Goods.

A very creditable exhibit of three-quarters stuff goods, consisting of plain and twilled mixtures, checks, stripes, cretonnes, and all-wool delaines; all very useful goods, and adapted for general consumption.

J U D G E S.

JOHN L. HAYES.
ELLIOT C. COWDIN.
CHARLES LE BOUTILLIER.
CHARLES J. ELLIS.
J. D. LANG.
CONSUL GUSTAV GEBHARD.
THEODORE BOCHNER, Jr.
HENRY MITCHELL.*

Dr. MAX WEIGERT.
LOUIS CHATEL.
CARL ARNBERG.
HAYAMI KENZO.
JOHN G. NEESER.
AUGUST BEHMER.
ALBERT DANINOS.

C L A I M.

The Washington Mills, of Lawrence, Mass., originally known as the Bay State Mills, were established thirty years ago, and are the most extensive manufactory of a general range of woollen goods in this or any other country.

The products of the woollen mills comprise shawls, flannels, coatings, beavers, cheviots, and many other styles of woollens.

In the worsted mills, coating of various kinds, for men's use, and ladies' dress goods in great variety, are produced.

In the cotton mill, with a capacity of 20,000 spindles, the product is varied to meet the changes and emergencies of the market.

A review of the history of this manufactory brings prominently forward certain leading lines of goods — now in constant and growing demand — that had their origin here, in the use of the inventive genius, enterprise, and capital that from the first have been lavishly employed by the company. Some of these facts have been mentioned (and which we will quote) in the general official report of the Board of Judges in Group Nine, at the late Centennial Exhibition.

* Signing Judge.

"In the important class of shawls, we naturally observe those most nearly allied in material and texture to the fabrics which we have been considering. The manufacture of the all-wool plaid shawls, formerly known in this country as the Bay State shawls, from the mill which introduced them, originated in Massachusetts, about 1848. Favored by the easy application of the cashmere twill to this fabric, and the facility with which the design is made, and varied, through the ultimate concurrence of the warp and woof, and still further aided by the adaptation of American wools to this fabric, it at once obtained perfection. The shawls of the Bay State Mills exhibited at the first International Exposition, that of 1852, were pronounced by French experts as 'quite remarkable for the lightness and softness of the stuff;' and shawls exhibited by the same mill at the Paris Exposition of 1867 were commended for the same qualities, as well as for their moderate price. This manufacture has an immense production, quite excluding foreign articles of the same grade."

About 1859 appeared, either through the Washington or Middlesex Mills, — for the honor is claimed by both, and the products of both vie with each other in celebrity — the blue flannel coating, indigo and wool dyed, and having a three-leaved twill. This fabric, sheared and finished like cloth, but retaining the lightness and flexibility of the flannel texture, forming an admirable material for summer garments, is distinctly American in origin and character. It has a large domestic consumption, and has become an article of export to South America.

Opera flannels — a name given abroad, from one of its original uses, to a light flannel, more highly gigged and finished than the ordinary article; being piece-dyed, uniformly, in many fancy colors, and hot-pressed — were first introduced into this country by the Bay State Mills.

The Exposition showed that the most formidable rivals of the fancy cassimeres are the fabrics known as worsted coatings. Being woven in the fancy loom, either Jacquard or Crompton, and made for the same purposes and by the same manufacturers as the fancy cassimeres, they differ from them only in the respect that the cassimeres are made of carded, and the worsted cloths of combed, wool. This fabric was created in France, and the introduction of its manufacture into this country affords another illustration of the benefits of international expositions.

Hon. E. R. Mudge, of Boston, being Commissioner of the United States at the Exposition of Paris in 1867, was impressed with these goods, then exhibited, and which were then being much worn as a

novelty in both London and Paris. Seeing that they were made of combed merino wool, Mr. Mudge made inquiries, to ascertain if suitable wools for these fabrics could be abundantly furnished by American fleeces. Satisfying himself affirmatively upon this point, he imported and introduced the requisite machinery for combing and spinning the wools, at the Washington Mills, in Lawrence, Mass., of which he was the Managing Director.

This establishment succeeded so well in the fabrication of these stuffs, and they proved so popular when put upon the market, that there immediately sprung up a host of rivals and imitators.

From the beginning, the present proprietors of the Washington Mills have conducted their operations on an extended scale. The capital is \$1,650,000. The total value of the product of the mills, for 1860, was \$2,000,000. The value of the annual production, during more recent years, has ranged from \$3,060,000 to \$3,500,000. The yearly consumption of wool exceeds 3,000,000 pounds; and that of cotton, from 1,500 to 2,000 bales. The value of the indigo and other dyes used each year is from \$150,000 to \$200,000; and 10,000 to 12,000 tons of coal are annually required.

About 2,500 operatives are employed, whose wages yearly aggregate \$900,000; and the most of whom occupy tenements provided for them by the corporation.

In 1862, Mr. E. A. Bourne, the first president, resigned, and Mr. Joseph S. Fay became his successor. After holding the office two years, Mr. Fay resigned, and was succeeded by Mr. John A. Blanchard; and the latter, in 1866, by Geo. R. Minot; who, in 1872, was followed by the present incumbent, Peter T. Homer.

The treasurership, vacated by Mr. Fay, in 1862, was conferred upon Mr. Joshua Stetson, who held the office until 1868, when he resigned on account of ill health.

After an interval of about one year, during which Mr. Mudge was the Managing Director, the present treasurer, Mr. Henry F. Coe, was elected. The present board of directors is composed of the following gentlemen: —

PETER T. HOMER, *President.*

E. R. MUDGE,
HENRY SALTONSTALL,
CHARLES U. COTTING,

CHAS. W. FREELAND,
ROBERT COUCH,
JOHN A. BLANCHARD, Jr.

McCALLUM, CREASE, & SLOAN, PHILADELPHIA, PA.**A W A R D .****PRODUCT: Carpets.**

An excellent exhibit of two and three ply ingrain carpets, unexceptionable in texture, design, and color ; the material and fabrication indicating excellent wearing qualities.

J U D G E S .

JOHN L. HAYES.
ELLIOT C. COWDIN.
CHARLES LE BOUTILLIER.
CHARLES J. ELLIS.
J. D. LANG.
CONSUL GUSTAV GEBHARD.
THEODORE BOCHNER, Jr.
HENRY MITCHELL.

Dr. MAX WEIGERT.*
LOUIS CHATEL.
CARL ARNBERG.
HAYAMI KENZO.
JOHN G. NEESER.
AUGUST BEHMER.
ALBERT DANINOS.

C L A I M .

This establishment is the second oldest carpet manufactory in the United States. The store and warehouse — a marble building on Chestnut Street, Philadelphia — was pronounced by Sir John Crossly, in 1875, the handsomest carpet store in the world ; and the works are on Carpenter Street, Germantown.

The business was established on its present site, in 1830, by the brothers Andrew and William McCallum, who had emigrated to America from Scotland, some two or three years previously. In the following year, 1831, they purchased the property from James Burke, the then owner. The factory is situated in a valley, in which there is a well-defined echo ; and this circumstance suggested the name of "Glen Echo Mills," by which the works are known throughout the United States, and even abroad. The number of hands employed during the first year or two was not more than thirty. For the first three or four years the machinery of the factory was driven by water-power ; but in 1835 they put in a steam-engine of ten-horse power. The capacity of the works increased until, in 1853, a fire occurred in

* Signing Judge.

the mills, which destroyed a part of the main building and much machinery. During the war of the Rebellion, the firm engaged in the manufacture of army blankets. For some portion of this time, the mill ran night and day, and was worked by two sets of hands. This house, now about completing a half century of existence, has grown with the growth of its particular industry, and with that of the State and country, and is now a representative house. The works cover an extent of two acres; a force of 350 hands is employed, and the machinery is driven by an engine of 250-horse power, with seventeen sets of cards.

Their principal production is extra-super ingrain carpets, — the class of carpeting which is the most in demand for general use. In this specialty the firm lead the trade; producing the best carpets of this description which are known either here or in Europe, as is shown by the fact that the "Glen Echo" can always command a higher price than any other kind. Of this ingrain they turn out in its various grades, inclusive of stair carpeting, about 1,500 yards per diem.

From 1845 to 1855 the firm were extensively engaged in the manufacture of Brussels carpeting by hand. But, owing to the competition of newly introduced power-loom, they suspended that branch until 1875, when they recommenced the manufacture of Brussels carpets, using power-loom. They are now producing an article equal to any in the market.

The firm spin all their own yarns, and are also enabled to do a large trade in supplying yarns to other manufacturers. The quantity of worsted and filling yarns produced for this purpose is about 1,800 pounds per diem, in addition to what is required for their own mills.

The consumption of wool is about two and a half million pounds per annum. In addition to their large manufacturing interest, this firm also carry on an extensive jobbing interest, and are the largest importers of carpets and wools in Philadelphia. The stock at the store in Chestnut Street embraces a very wide variety. The members of the firm were at first the two brothers, Andrew and William McCallum. In 1841, on their adding a city warehouse to the business, Charles J. Hendrickson was admitted into the partnership. In 1855, Andrew McCallum died, and Charles J. Hendrickson retired, leaving the business in the entire control of William McCallum. In 1859, Hugh McCallum, Orlando Crease, and Andrew J. Sloan, were admitted into the firm, and the style became McCallum & Co. In 1866, William McCallum retired from active participation in the business, when the firm name was altered to its present form.

THOMAS POTTER, SONS & CO., PHILADELPHIA, PA.

A W A R D.

PRODUCT: Oil-Cloth.

Commended for their very great variety, excellent quality, numerous, original, and artistic designs, rich finish and colors; admirable in every way.

J U D G E S.

EDWARD ATKINSON.
HUGH WADDELL, Jr.
EDWARD RICHARDSON.
A. D. LOCKWOOD.
CHAS. H. WOLFF.
SAMUEL WEBBER.
GEORGE O. BAKER.
ISAAC WATTS.

WM. W. HULSE.*
DON ALVARO DE LA GANDARA.
ARNOLD GOLDY.
GUSTAV HERRMANN.
JOSEPH DASSI.
MENI RODRIGUES DE VASCON-
CELLOS.

C L A I M.

To the oil-cloths manufactured by the firm of Thomas Potter, Sons & Co., of Philadelphia, was awarded the only medal, by the judges of the Centennial Exhibition at Philadelphia, in 1876. In addition to this distinction, the following tribute was paid to the productions of this firm, by Isaac Watts, Esq., of England, the President Judge of Group Eight, in his official report:—

“The other class upon which I had to form a judgment, in connection with my co-judges in textile machinery, was that of *oil-cloths*. In this class I had no hesitation in assigning the first place to the United States, for great variety, beauty of design, richness of colors, and quality of texture, in oil floor-cloths, table-cloths, carriage-cloths, and fancy cloths for upholstery; the best exhibit, in my opinion, being that of Messrs. Potter, Sons & Co.”

The factories of this firm are located at the junction of the New York branch of the Pennsylvania Railroad and Second Street, Philadelphia; the warehouses and office, at 418 Arch Street. The facilities of this firm for manufacturing are unequalled; factories covering four acres of ground, replete with every machine applicable to this

* Signing Judge.

branch of industry. Every part of the buildings heated with steam-heating apparatus. Trained and practised workmen, and the best talent in designing, employed. Ample capital to buy for cash all the materials used in their productions. The productions are floor oil-cloth, of original designs, in great variety, artistic in form and coloring, made and seasoned, to be used and safely handled in any climate; furniture oil-cloths, in woods and marbles and prints, smooth, brilliant, flexible, workmanship exquisite. Carriage-makers' and upholsterers' enamelled oil-cloths, ducks, drills and muslins; blacks, browns, drabs, blues, greens, bright and dull finished; elastic, smooth, bright, enamelled in various grains, will be found pliant in the frosty North, and free from adhesive qualities in the sunny South. The "Potter Oil-Cloth Works" is capable of manufacturing over two million square yards of oil-cloths, annually. There are two distinct factories; one for the furniture and enamelled oil-cloths, and the other for floor oil-cloths. There is no article in the oil-cloth line that is not manufactured in this establishment.

The firm of Thomas Potter, Sons & Co., was formed in 1870. The present firm consists of Thomas Potter, Sen., Edward S. Worrell, James F. Hope, Thomas Potter, Jr., and William Potter. George Potter, a member of the firm, died October, 1876. Thomas Potter, Sen., has been engaged in manufacturing oil-cloths since 1840. He was a skilled workman when he commenced the manufacturing in said year, as one of the firm of Potter & Carmichael.

He purchased in 1848 the Bush Hill Oil-Cloth Works, at Eighteenth and Spring Garden Streets, that had been erected for the first oil-cloth factories in the United States, by Isaac Macauley, who began the business in Philadelphia in 1810. The growth of the city, also the growth of Mr. Potter's business, made the removal of the factories a necessity. The removal to the present location was consummated in 1872, and the old lot sold for building purposes. The success of this branch of manufacturing in Philadelphia is largely due to the practical knowledge of the senior member of the firm. The present firm are all in the prime of manhood, understand their business thoroughly, have capital and enterprise, and are on the way to greater success and distinction as oil-cloth manufacturers.

ARLINGTON MILLS, LAWRENCE, MASS.

The United States Centennial Commission has examined the report of the judges, and accepted the following reasons, and decreed an award in conformity therewith.

REPORT ON AWARDS.

PRODUCT: Alpacas and Brilliantines.

Name and Address of Exhibitor :

ARLINGTON MILLS, LAWRENCE, MASS.

The undersigned, having examined the product herein described, respectfully recommends the same to the United States Centennial Commission for award, for the following reasons, viz. : —

For a very superior collection of black alpacas, brilliantines, figured mohairs, and Roubaix poplins ; all first-class goods of their kind, very uniform in width, color, and finish, and, being of recent introduction, reflect great credit on the manufacturers.

HENRY MITCHELL.

(Signature of the Judge.)

Approval of Group Judges.

JOHN L. HAYES.
ELLIOT C. COWDIN.
CHARLES LE BOUTILLIER.
CHARLES J. ELLIS.
J. D. LANG.
CONSUL GUSTAV GEBHARD.
THEODORE BOCHNER, Jr.
HENRY MITCHELL.

Dr. MAX WEIGERT.
LOUIS CHATEL.
CARL ARNBERG.
HAYAMI KENZO.
JOHN G. NEESER.
AUGUST BEHMER.
ALBERT DANINOS.

A true copy of the record :

FRANCIS A. WALKER,
Chief of the Bureau of Awards.

Given by authority of the United States Centennial Commission.

A. T. GOSHORN, Director-General
J. R. HAWLEY, President.

J. L. CAMPBELL, Secretary.

The Arlington Mills are located on the Spicket River, in the city of Lawrence, Essex County, Massachusetts. This company was incorporated under the General Statutes, in 1865, under the title of the Arlington Woollen Mills, with a capital stock of \$200,000. The original incorporators were Robt. M. Bailey, Chas. A. Lambard, Joseph Nickerson, and George C. Bosson.

The business in which the mills first engaged was the manufacture of fancy shirting flannels and woollen-felted fabrics.

In October, 1866, the mills were totally destroyed by fire, entailing a severe loss upon the company. The proprietors were not discouraged by this disaster; but immediately began the erection of a new mill, which was completed early in 1867, and in April of the same year the capital stock was increased to \$240,000. The tariff of 1866 having given a stimulus to the worsted industry of the country, then in its infancy, the proprietors were encouraged to embark in it, and decided to manufacture women's worsted and cotton dress goods. For this purpose, there were put into the new mill 175 looms, with the necessary worsted-preparing machinery. In the prosecution of this business, great difficulties were encountered, such as always attend the inauguration of a new industry, and proprietors less courageous and determined would have been disheartened, when, at the close of the year 1869, the financial condition of the company was found to be such as to necessitate a reorganization. The shareholders met the requirements, and paid into the treasury the whole amount of the capital stock (\$240,000) to make the same good. A change was made in the management, by the election of Joseph Nickerson for President, and William Whitman for Treasurer and General Agent. The work of remodelling and increasing the productive capacity of the mills was begun in 1871; and since then additions of machinery and buildings have from time to time been made, until now the company operates 508 looms, producing 5,000,000 yards of cloth annually, and giving employment to 600 persons.

In 1875, the title of the company was changed by act of the legislature to the Arlington Mills. In July, 1876, the capital stock was increased to \$320,000; and in May, 1877, it was further increased to \$400,000.

The Arlington Mills now make a specialty of the manufacture of *black alpacas*, *mohairs*, and *brilliantines*; and they were the first to successfully produce these goods in the United States. Their manufacture was begun in 1872; and at that time it was believed that such goods could not successfully be made elsewhere than in Bradford. Eng-

land: but this company has demonstrated that they can be made in the United States equal, if not superior in every respect, to the productions of the best manufacturers in the old-established seats of the worsted industry in Europe. To accomplish this result, no expense or labor has been spared by this company; its first aim having been to produce good goods.

The mills are located in the heart of the manufacturing centre of New England, where skilled labor naturally gravitates; and this company endeavors to retain such permanently in its employ, by the payment of liberal wages, by making the surroundings of the mill healthful and cheerful, by taking all necessary precautionary measures for the prevention of accidents and for the security of life, and by careful attention to all that affects the moral and physical well-being of its employés. The report of the Judges of Award on this company's exhibit at the Centennial Exhibition evidences the advanced state of its manufacture; the goods exhibited comprising all of the regular qualities making at that time.

It is claimed for these goods that, in all that comprises excellence of manufacture, in evenness, firmness of weave, lustre, brilliancy, and durability of color, and in silkiness of finish, they are unsurpassed by similar fabrics of any country.

It is the determination of the managers of this company, not only to maintain the present high standard of their fabrics, but to spare no effort to attain, if possible, greater excellence, and to furnish to the trade goods that may always be relied upon as the best of their kind.

This business was inaugurated under the present management.

OFFICERS.

President.

JOSEPH NICKERSON.

Treasurer and General Agent.

WILLIAM WHITMAN, 40 Water Street, Boston.

Superintendent of Mill.

SAMUEL SMITH.

Selling Agents.

LAWRENCE & Co., 13 Chauncy Street, Boston; 109 & 111 Worth Street, New York.

THOS. T. LEA & Co., 325 Chestnut Street, Philadelphia.

MIDDLESEX COMPANY, LOWELL, MASS.**A W A R D.****PRODUCT: Woollen Goods.**

Commended for indigo-blue police-flannels, cadet uniform, and yacht cloths, with police beavers ; all of substantial fabrication, and adapted for uniformed schools, city police, and for general consumption ; also, for large shawls, in excellent colors, at moderate prices.

J U D G E S.

JOHN L. HAYES.
ELLIOT C. COWDIN.
CHARLES LE BOUTILLIER.
CHARLES J. ELLIS.
J. D. LANG.
Consul GUSTAV GEBHARD.
THEODORE BOCHNER, Jr.
HENRY MITCHELL.

Dr. MAX WEIGERT.
LOUIS CHATEL.
CARL ARNBERG.
HAYAMI KENZO.
JOHN G. NEESER.
AUGUST BEHMER.
ALBERT DANINOS.

A history of the Middlesex Mills, Lowell, Mass., covers the entire life of the successful woollen industry in this country ; and includes, as the work of that establishment, some of the most important adaptations of wool to popular and universal use known in manufactures. One of its early achievements is thus alluded to, in the general official report of the judges at the Centennial Exhibition, while speaking of the diminution of one class of fabrics in American manufacture : —

“ The capacity to manufacture the finest broadcloths in this country was proved, many years ago, by the celebrated Middlesex Mills, of Lowell, Mass. ; in age, influence, and continuity of *excellence*, standing at the very front of our cloth mills. In ceasing to give prominence to that specialty, they manifest no failure in skill, but simply an adaptation to the wants of the times.”

Fancy woven goods, in their various styles, comprise more than three-quarters of all the cloths made at the present day. Both the machinery that produced them, and the first goods put on the market, originated in the Middlesex Mills. We quote the language of Hon. Samuel Lawrence, then agent of the mills, descriptive of the fact : —

“ When the Middlesex Company started, in 1830, most of the woollen goods consumed here were from England, imported by men

from Yorkshire, who for many years evaded paying the full amount of duties, by means of undervaluation. For many years before, the managers of the Middlesex had been importers of woollens, and the writer of this was often in England, and obtained such information as caused the sudden departure from the country of all the men named by Mr. Clay in Congress, in 1828, 'the drab-gartered gentry.' When Jesse Hoyt, in 1837, became the collector of New York, the writer of this gave him such information as caused the seizure of all the English woollens fraudulently imported, and the instant departure of the importers; their doings being penal offences. The trial on these seizures lasted more than two years, the decisions being in favor of the government. The Middlesex Company employed and paid eminent counsel to assist the law officers of the government.

"One of the difficulties in the early production of woollens here was a defect in dyeing. This company was most fortunate in early discovering that this evil arose from the simplest cause,—the imperfect cleansing of wool. Until 1840, woollen fabrics were of plain face, with a lustre from steam or hot-water finish. In 1839, Messrs. Bonjean, of Sedan, France, the most eminent manufacturers of wool in Europe, brought out a fabric of uneven surface like dimity in cotton. This was from a hand-loom. The Crompton Loom was invented in Taunton, this State, by William Crompton, in 1837, for a cotton mill there; and, owing to the failure of parties, had not been put into operation. In 1838, Mr. Crompton took his loom to England, where it was adopted in Manchester; and in 1839 he returned to this country, and at once became employed by the Middlesex Company to adapt his principle to their looms, to produce a fabric like the Sedan, and was entirely successful. Thus commenced, in this country, the manufacture of fancy cassimeres.

"The shawl manufacture by the Middlesex Company was commenced in 1847. Up to that time the fringes were twisted by hand, and the success depended on its being done by machinery. At that time Mr. Milton D. Whipple was in the employment of the company, perfecting a felting machine; and he was employed to produce a twisting machine for fringes, in which he succeeded perfectly, and thus gave this branch of industry to this country. The Bay State Mills afterward went into the shawl manufacture upon a very large scale, making yarn dyes.

"The manufacture of felted fabrics was undertaken by the Middlesex Company, for the purpose of using up the waste of various kinds incident to a woollen mill.

"In 1858-59, the Middlesex commenced the manufacture of a blue flannel coating, indigo and wool dyed, and having a three-band twill. This fabric, finished like a cloth but retaining the pliability of the flannel, has become very popular, and has a very large domestic and considerable foreign consumption."

The Middlesex Company was incorporated in 1830, with a capital stock of \$100,000, which was increased from time to time to \$1,000,000. In 1857, this company, like so many of its fellows, was obliged to ask for an extension, and to call in additional capital. The nominal value of the old stock was at the same time reduced. The capital stock now stands at \$750,000. The company operates 49 sets of cards, and employs 800 hands. The annual consumption of wool is about 1,500,000 pounds; and the value of the product at present prices, \$1,300,000.

We claim that the standard of excellence, as to all the goods of the Middlesex Company, which was long since established, is still maintained, in the Beavers, Coatings, Ladies' Sackings, Shawls, Cassimeres, Flannels, &c., now made by us.

The officers of the company are:—

President.

JAMES L. LITTLE.

Directors.

JAMES L. LITTLE.

NATHANIEL HOOPER.

GEORGE HIGGINSON.

T. JEFFERSON COOLIDGE.

B. F. BUTLER.

P. H. WENTWORTH.

R. S. FAY.

Treasurer.

R. S. FAY.

Clerk.

A. C. TENNEY.

Selling Agents.

PERRY, WENDELL, FAY, & Co.

UTICA STEAM COTTON MILLS, UTICA, N. Y.

A W A R D.

PRODUCT: Cotton Sheetings and Shirtings, Bleached and Unbleached.

A fabric in various widths, of great excellence in texture and general finish.

B. F. BRITTON.

(Signature of the Judge.)

Approval of Group Judges.

CHARLES STAPLES, Jr.
JAMES L. CLAGHORN.
S. F. BAIRD.
HENRY H. SMITH.

COLEMAN SELLERS.
J. FRITZ.
EDWARD CONLEY.
H. K. OLIVER.

C L A I M.

This company commenced the manufacture of wide sheetings and shirtings in 1850, with a capital of \$200,000; their mill containing 8,000 spindles, with corresponding machinery. They now have two large mills, about 35,000 spindles, and a capital invested and in use of nearly \$1,000,000.

The sheetings and shirtings manufactured by this company are of various widths, from 36 to 108 inches, as stated below, and are highly recommended for their great *weight, fineness, and perfection* of yarn, and *uniformity* in their manufacture. They are known to the trade and consumers by the corporate name as labeled, "Utica Steam Cotton Mills." One of their styles, a very *fine* and *heavy* bleached shirting, has the additional label of *Nonpareil*.

Various widths manufactured, all of same quality, except *Nonpareils*, which are *finer*, and equally as *heavy*.

Brown.	Bleached.
36 inches.	35 inches.
40 "	36 "
48 "	45 "
58 "	54 "
78 "	72 "
86 "	81 "
96 "	90 "
108 "	100 "

E. CHAMBERLAIN, <i>Treasurer</i> , ...	Utica, N. Y.
GEORGE H. WILEY, <i>Superintendent</i> , ...	" "
WOODWARD, LAWRENCE, & Co., <i>Selling Agents</i> ,	New York City.
STOKES, CALDWELL, & Co., " "	Philadelphia.

**WALCOTT & CAMPBELL, NEW YORK MILLS,
ONEIDA CO., N. Y.**

The United States Centennial Commission has examined the report of the judges, and accepted the following reasons, and decreed an award in conformity therewith.

REPORT ON AWARDS.

PRODUCT: Cotton Fabrics.

Name and address of Exhibitor:

**WALCOTT & CAMPBELL, NEW YORK MILLS,
ONEIDA CO., NEW YORK.**

The undersigned, having examined the product herein described, respectfully recommends the same to the United States Centennial Commission for award, for the following reasons, viz. :—

Fine bleached cottons ; firm, uniform, well bleached and finished, of very superior quality.

ISAAC WATTS.

(Signature of the Judge.)

Approval of Group Judges.

**EDWARD ATKINSON.
SAMUEL WEBBER.
GEORGE O. BAKER.
JOSEPH DASSI.
ARNOLD GOLDY.
A. D. LOCKWOOD.
EDWARD RICHARDSON.**

**WM. W. HULSE.
CHARLES H. WOLFF.
GUSTAV HERRMANN.
HUGH WADDELL, Jr.
MENI RODRIGUES DE VASCON-
CELLOS.
DON ALVARO DE LA GANDARA.**

A true copy of the record :

**FRANCIS A. WALKER,
Chief of the Bureau of Awards.**

Given by authority of the United States Centennial Commission.

**A. T. GOSHORN, Director-General.
J. R. HAWLEY, President.**

J. L. CAMPBELL, Secretary.

The New York Mills are located three miles west of Utica, and one mile south of the New York Central Railroad, in the village of New York Mills, Oneida Co., N. Y., and upon the Saquoit Creek, a stream of water which has been made available for manufacturing purposes from early times. The original mills of this company (the firm then being Marshall & Walcott) were among the first in this State, and pioneers in cotton manufacturing in this country. Since then, other mills and a bleachery have been built, and kept in almost constant operation: the busy hum of spindle and shuttle has been a song of honest industry in this quiet valley for more than half a century. These mills have succeeded in establishing and maintaining a reputation second to none for the uniform excellence of their manufactures; the New York Mills shirtings having long been known for their superiority over all other goods of the same class, — a fact attested by medals and diplomas, from first premiums awarded in every competitive examination to which they have been subjected.

The New York Mills now consist of four mills, respectively designated as the Upper Mills, Central, and Lower Mills, each provided with water and steam power. Their productions consist of the New York Mills water-twist, twilled, and regular shirtings, ladies' wear; fine sheetings from 5-4 to 12-4 in width, and a large variety of cottonades, jeans, camlets, double and twist, fancy cassimeres, knitting cottons, &c.

The proprietors, Messrs. Walcott & Campbell, aim to maintain the high reputation their goods have attained, by careful attention to every detail, a determination to improve wherever improvement is possible, and a prompt compliance with the demands of their customers and the public as to style and finish. They bleach and finish their own goods, and also the goods of neighboring mills. Especial care and attention are given to this branch of the business.

Post-office address: Walcott & Campbell, New York Mills, Oneida Co., N. Y. Agency in New York: Haslehurst & Brother, 70 and 72 Leonard Street.

GEO. H. GILBERT MANUFACTURING CO., WARE, MASS.**A W A R D.****PRODUCT: Flannels and Blankets.**

An imposing display of flannels and blankets, the former consisting of all-wool White, Silk Warp, Gauze, Moleskin, Shaker, Domett, and Opera flannels,—the scarlet and blues of the latter especially striking; the blankets, made of Ohio and West Virginia wool, are noticeable for their softness of material and excellence of manufacture.

J U D G E S.

JOHN L. HAYES.
ELLIOT C. COWDIN.
CHARLES LE BOUTILLIER.
CHARLES J. ELLIS.*
J. D. LANG.
CONSUL GUSTAV GEBHARD.
THEODORE BOCHNER, Jr.
HENRY MITCHELL.

DR. MAX WEIGERT.
LOUIS CHATEL.
CARL ARNBERG.
HAYAMI KENZO.
JOHN G. NEESER.
AUGUST BEHMER.
ALBERT DANINOS.

C L A I M.

In 1841, Messrs. Gilbert & Stevens purchased a brick factory in Ware, Mass., and commenced the manufacture of woollen goods; soon making a specialty of fine white flannels. It is claimed that Mr. George H. Gilbert was the first successful manufacturer in the country of this fabric. In 1846, they built another mill, of stone, using in all ten sets of machinery.

The firm early acquired a high reputation in fine flannels; and, at the World's Fair in London, in 1851, they received "special mention, for excellence" in these fabrics.

In 1851, the firm was dissolved; Mr. Gilbert taking the new stone mill, and there continuing the manufacture of white, all-wool flannels, silk warp, and gauze; and these goods at once made a reputation as the leading brand in this line of manufactures.

In 1857, Mr. Gilbert admitted his nephew, Lewis N. Gilbert, as partner, under the firm name of Geo. H. Gilbert & Co.; and in 1858, commenced the manufacture of "Opera Flannels," in addition to their other lines of goods, running seven sets of machinery. The product of this class of goods was 4,000 pieces the first year, in one hundred shades of color. These operas soon became as popular as the white flannels, taking the first place in the market. In fact, soon after this date, the resident buyer of A. T. Stewart & Co., who was then ordering this class of goods in Europe, was on a visit here, and, meeting

* Signing Judge.

these flannels in the New York market, said, "If you can buy this line of goods here, it is useless to go abroad for them; for these are better than any you can purchase there." They have since commanded the market, to the exclusion of foreign make of the same character; being specially noted for brilliant fast colors, and beauty of finish. In the examination of this class of fabrics at the late Centennial Exhibition, the experts were much impressed with the exhibit from our factory; and, in addition to the award given above, the judges made the following reference in their general official report:—

"Opera flannels have gained their command of the American market, principally through the fabrication of a manufacturer of Ware, Mass., now deceased,—Mr. Geo. H. Gilbert. He commenced the manufacture in 1858, making in that year four thousand pieces. In 1871, his establishment made and sold of this single fabric one hundred and twenty thousand pieces, or nearly two million yards. At this time, foreign importations of this fabric have entirely ceased."

The class of goods that won the award and this commendation were the same as the present daily product of the mills. It is not our intention the quality shall be depreciated, or the encomium be less deserved, in the future.

In 1860, Geo. H. Gilbert & Co. purchased a water-power in the adjoining town of Hardwick, and built there the first brick mill of eight sets, in what is now the flourishing village of Gilbertville. In addition to the manufacture of flannels, they there commenced the manufacture of Balmoral skirts, soon vying with their operas in popularity, and reaching a production of one thousand skirts per day,—the largest amount of any one concern engaged in their manufacture.

In 1867, the business was incorporated as "The George H. Gilbert Manufacturing Co." To meet the demand for their goods at this time, another mill, of brick, 68 × 230, and five stories high, was built, containing 17 sets of new machinery; and added to their four other mills, making 35 sets in all. Mr. George H. Gilbert died in 1869. He was prominent in the development of the woollen industry of the United States, and a firm and consistent believer and agent in the policy of protection to our native industries; foreseeing that this was vital to the development, growth, and permanent nature of our institutions, and chief among the agencies in making his native land prominent among the nations of the earth.

In addition to recognition abroad for the merit of our goods, as stated above, we have premiums from various exhibitions at home; embracing those of New York, Boston, Philadelphia, and Baltimore. We are producing in large variety, fine all-wool White, Shaker, Silk Warp, Gauze, Domett, Plaid, and Opera flannels,—the last in four qualities, and of one hundred shades; also, a large line of blankets and fancy goods for ladies' wear. These we warrant as not excelled either at home or abroad. The officers of the corporation are as follows:—

LEWIS N. GILBERT, *President.*

CHAS. D. GILBERT, *Treasurer.*

J. H. GRENVILLE GILBERT, *Secretary.* }

Two sons of
GEO. H. GILBERT.

JANENTZKY & CO., PHILADELPHIA, PA.**A W A R D.****PRODUCT: Artists' Materials.**

Commended for general excellence of artists' supplies; brilliancy of colors, judicious selection and adaptation of materials, and carefulness in manufacture.

J U D G E S.

JAMES M. WILCOX.
C. O. CHAPIN.
WM. FAXON.
EDWARD CONLEY.

H. T. BRIAN.
Sir SYDNEY H. WATERLOW.*
G. W. SEITZ.

CL A I M.

The business was founded in 1856, by Julius Scholz and Charles Janentzky, under the firm name of Scholz & Janentzky. After the death of Mr. Julius Scholz in 1868, it was continued by Mr. Charles Janentzky, under the firm name of Janentzky & Co., and at the close of 1876 he admitted Mr. Frederick Weber as partner.

During this short period of existence, the business has gained them the reputation of being one of the leading houses of the United States in their line of trade. In fact, they are unsurpassed in their manufacture of artists' materials, as well as in the great variety of their stock pertaining to every branch of art.

They were awarded prize medals and diplomas for the manufacture of artists' oil and water colors at the

Cincinnati Industrial Exhibition in 1870,
Vienna International Exhibition in 1873,
Philadelphia Franklin Institute in 1874, and
Philadelphia International Exhibition in 1876.

* Signing Judge.

WAMSUTTA MILLS, NEW BEDFORD, MASS.

The United States Centennial Commission has examined the report of the judges, and accepted the following reasons, and decreed an award in conformity therewith.

REPORT ON AWARDS.

PRODUCT: Cotton Fabrics.

Name and address of Exhibitor:

WAMSUTTA MILLS, NEW BEDFORD, MASS.

The undersigned, having examined the product herein described, respectfully recommends the same to the United States Centennial Commission for award, for the following reasons, viz.:—

For the uniformity, excellence, and purity of their well-known fabrics.

ISAAC WATTS.

(Signature of the Judge.)

Approval of Group Judges.

EDWARD ATKINSON.

SAMUEL WEBBER.

GEORGE O. BAKER.

JOSEPH DASSI.

ARNOLD GOLDY.

A. D. LOCKWOOD.

EDWARD RICHARDSON.

WM. W. HULSE.

CHARLES H. WOLFF.

GUSTAV HERRMANN.

HUGH WADDELL, Jr.

MENI RODRIGUES DE VASCON-
CELLOS.

DON ALVARO DE LA GANDARA.

A true copy of the record:

FRANCIS A. WALKER,

Chief of the Bureau of Awards.

Given by authority of the United States Centennial Commission.

A. T. GOSHORN, *Director-General.*

J. R. HAWLEY, *President.*

J. L. CAMPBELL, *Secretary.*

The Wamsutta Mills, located in New Bedford, Bristol County, Mass., date their organization in 1847, when the first mill of 15,000 spindles was commenced. As the demand for their goods increased, additional mills have been erected. In 1854, No. 2 Mill; 1865, No. 3 Mill; 1868, No. 4 Mill; 1875, No. 5 Mill: containing in all 150,000 spindles, with a capital of \$2,500,000. Their production is chiefly the well-known Wamsutta fine shirting, producing a large portion of all this quality made in the United States; also, a superior sheeting, in plain, twilled, and double warp, in a variety of widths, from 32 to 108 inches. All their cloths are warranted to be fully the width they purport to be; and they are in condition to make a very large variety of goods, including fine cambric muslin, percales, fine umbrella cloths, and medium grade of Victoria lawns. The popularity of the goods attests their excellent quality; beginning with a high standard, they have constantly aimed not only to maintain but to elevate it, and to-day their manufactures have no superior; and their name for fine shirting and sheeting has become a household word in a majority of the homes of this country.

Great care is taken in the selection of cotton, especially with reference to staple; their annual consumption of which is 19,000 bales, producing 20,000,000 square yards of cloth.

President.

JOSEPH GRINNELL.

Directors.

JOSEPH C. DELANO.
GEORGE O. CROCKER.
CHARLES L. WOOD.
WILLIAM L. KOTCH.

WILLIAM W. CRAPO.
EDWARD D. MAUDELL.
HORATIO HATHAWAY.

Treasurer.

ANDREW G. PIERCE.

Resident Agent.

EDWARD KILBURN.

Selling Agents.

LEWIS BROTHERS, & Co., Boston, New York, and Philadelphia.

McCROSSAN & FARR, NEW YORK.**A W A R D .****PRODUCT: Cotton Handkerchiefs.***Commended for style, finish, color, and quality.***J U D G E S .**

EDWARD ATKINSON.
HUGH WADDELL, Jr.
EDWARD RICHARDSON.
A. D. LOCKWOOD.
CHARLES H. WOLFF.
SAMUEL WEBBER.
GEORGE O. BAKER.
ISAAC WATTS.*

W. W. HULSE.
DON ALVARO DE LA GANDARA.
ARNOLD GOLDY.
GUSTAV HERRMANN.
JOSEPH DASSI.
MENI RODRIGUES DE VASCON-
CELLOS.

C L A I M .

Manufacturers of white and printed handkerchiefs exclusively, and sell only to the jobbing trade. The senior member of the firm has been connected with the manufacture and sale of handkerchiefs for thirty years, both in Scotland and this country. Our goods exhibited at the Exposition were samples of our regular stock. New styles are added every season. We are the oldest and largest manufacturers of printed handkerchiefs in this country; and all goods made by us have fast colors.

Factory is in Paterson, New Jersey.

Salesroom at 84 Franklin Street, New York.

* Signing Judge.

J. & P. COATS, PAISLEY, SCOTLAND.

A W A R D.

PRODUCT: Sewing Cotton.

Commended for the superior strength and excellent quality of spool cotton.

J U D G E S.

EDWARD ATKINSON.
HUGH WADDELL, Jr.
EDWARD RICHARDSON.
A. D. LOCKWOOD.
CHAS. H. WOLFF.
SAMUEL WEBBER.*

GEORGE O. BAKER.
ISAAC WATTS.
W. W. HULSE.
DON ALVARO DE LA GANDARA.
GUSTAV HERRMANN.
JOSEPH DASSI.

On Sept. 28, 1876, a register was kept of the number of persons who inspected Messrs. J. & P. Coats's exhibit of spool-cotton at the Centennial Exhibition on that day. The total number from nine in the morning until five in the afternoon was 5,375. Recorded by hours, the register showed as follows: from nine to ten o'clock the number was 701; from ten to eleven, 858; from eleven to twelve, 806; from twelve to two, 750; from two to three, 800; from three to four, 750; and from four to five, 710. The extraordinary interest thus evinced shows the importance which the manufacture of spool-cotton has assumed; and, indeed, few, if any, productions hold a more prominent place in our domestic necessities. In every household throughout the civilized world, this article is in incessant demand; in thousands upon thousands of work-rooms busy fingers are using it in the production of the countless garments which the poor and rich alike need, embracing in the varied scale those which absolute necessity requires to be made at the lowest possible cost, as well as those which minister to the equally exacting, although more artificial, demands of luxury and display.

To be enabled to view the progressive stages of the manufacture of an article in so incessant and varied a demand was an unprecedented novelty; and the long-established reputation of J. & P. Coats's spool-cotton naturally aroused the keenest desire on the part of visitors at the Exhibition to become acquainted with the processes of its production. The mode in which the firm made their exhibit and detailed those processes was worthy of their reputation.

Our engraved illustration will recall the attractive appearance of

* Signing Judge.

their stand, and remind such of our readers as visited the great show of those special matters of interest which it contained. They will remember that an epitome of the actual operations of the mill was presented to them, affording similar instruction and information to that which would have been imparted by an actual visit to it. First, the cotton was shown in the state which it presents on the skein; next, in that which it takes on the frames; then, in that which it assumes after its passage thence to the bobbins; and, finally, its interesting progress to the spools was exhibited, showing, on its arrival there, the perfected result which is familiar to every person in the land.

In every link of mechanic process which leads up to the final stage, some unexpected and agreeable surprise awaited the spectator: for instance, the ingenious nature of the contrivance by which the gloss or finish was given to the thread, merely by its rapid passage through the groove of a machine which, without the use of sizing or any other aid, accomplished the required result. The visitor was made to understand that the success of this operation depended upon a lightning-like velocity in the machine, and called upon it for a speed of no less than five thousand revolutions per minute. To have each spool of cotton contain the exact quantity of two hundred yards, which its label represents it to contain, is a point no less important to the manufacturer than to the buyer; and the visitor found that the certain assurance of that quantity (neither more nor less) being wound upon each spool was accomplished by the ingenious winding-machine, whose operations were explained to him; and it was seen, with further surprise and admiration, that only one female attendant was required to superintend the working of a machine of two winders, which turned out an extraordinary amount of work. The final process of affixing the label to each end of the spool, giving the number and quantity of the thread, the name of the manufacturers, and other particulars, is no doubt popularly supposed to be done by hand; but one of the exhibited processes showed it to be done, with marvellous celerity, by a machine, which was exhibited in its working operation to the astonished and delighted visitor.

We have not attempted to give a scientific description of these various specimens of mechanic ingenuity. To the general reader their nice and intricate details would be to a great extent inexplicable, while to the learned in this branch of machinery they would be familiar. It is our purpose rather to describe, in general but interesting terms, the main features of Messrs. J. & P. Coats's most attractive exhibit, and the popular nature of the instruction which it afforded to the tens of thousands of visitors who were attracted to its inspection by the deserved and long-established reputation of the thread.

The firm of J. & P. Coats, of Paisley, in Scotland, is one of the oldest in this extensive manufacture. We are not informed of the amount of their annual production and sale; but believe we are correct when we say that it is very great, and extends into every quarter of the globe. The terms in which the award and diploma that have been presented to the firm by the judges and Centennial Commission-

ers are couched, satisfactorily account for this when they say that the distinction has been conferred for "superior strength and excellent quality." In these two attributes, all the essentials of a first-class thread are embraced. To both of those points, the exertions of these manufacturers have always been directed, and to the realization of them their eminence is attributable. Sea Island cotton is used by them invariably in the fine numbers for sewing-machines,—a staple which is well known to be at the head of all for length and tenacity of fibre; and we are informed that an undeviating practice is observed of testing the quality not only of this but of every other brand of cotton before it is subjected to the processes of manufacture, resulting in the rejection of all imperfect samples; and that the same supervision is maintained throughout all the stages of its production, so that every imperfection, whether in material or manufacture, is detected and condemned. Conscientious efforts like these have produced, and continued perseverance in them cannot fail to maintain, the reputation which the exhibit of J. & P. Coats's spool-cotton at the Centennial Exhibition has justified. And we ought to state that the award which they obtained at Philadelphia had been preceded by similar distinctions granted to them at the London Exhibition of 1862; that of Paris, in 1867; and, finally, that at Vienna, in 1873, when the rare honor of knighthood, with the ribbon of the Order of Francis Joseph, was conferred upon the senior member of their firm. This honor was very sparingly bestowed, and is esteemed more highly than any which has ever been conferred at an International Exhibition.

The variety of colors exhibited by the firm attracted marked commendation; many of them showing novel shades, and all claiming to possess the important quality of long retention of color. It is stated that every grade and color is applicable to any sewing-machine.

The firm of J. & P. Coats not only carry on the manufacture of their thread at their extensive works at Paisley, in Scotland, but have also a large establishment for facilitating their operations in this country at Pawtucket, R. I. Their principal agents for the United States are the Messrs. Auchincloss Brothers, 47 and 49 White Street, New York; and their other agencies are those of Messrs. Bates & Coates, 209 Church Street, Philadelphia; Messrs. A. S. March & Co., 20 Lincoln Street, Boston; and Messrs. Kittle & Co., corner of California and Front Streets, San Francisco.

L. J. KNOWLES & BROTHER, WORCESTER, MASS.**A W A R D.****PRODUCT: Open-Shed Fancy Looms for Cotton, Wool, and Silk.**

For originality of invention, substantial and good construction of machinery, smoothness of working, facility for effecting changes, and for manipulating, economy, quality, and variety of work produced.

J U D G E S.

W. W. HULSE.
GUSTAV HERRMANN.
A. D. LOCKWOOD.
SAMUEL WEBBER.
JOSEPH DASSI.
EDWARD RICHARDSON.

M. R. DE VASCONCELLOS.
HUGH WADDELL, JR.
EDWARD ATKINSON.
DON ALVARO DE LA GANDARA.
ISAAC WATTS.
GEORGE O. BAKER.

C L A I M.

The above is the well-merited award to our open-shed fancy loom, constructed upon a principle entirely new, and combining all the improvements suggested by more than twenty years of experience in building weaving machinery of every description. Many years ago, the inventor became convinced that looms for weaving fancy woollens, worsteds, &c., were faulty in many respects. The constant elevation and depression of all the harnesses and all the threads of the warp at each pick (as in the closed-shed loom) consumed a great amount of power, and was also a needless wear and strain upon the warp; making it extremely difficult to produce perfect goods, except from the best of yarn. Another difficulty was the liability to mispicks, on account of the imperfection of the mechanism for operating the boxes. The difficulty of finding the pick when lost, from any cause, and the great amount of waste and delay in picking out, were also causes of vexation and loss. These features of the closed-shed loom led to the invention of our open-shed fancy loom, patented Feb. 24, 1863; with its pick-out patented Jan. 21, 1873.

The loom is of the first class of workmanship, and is very durable. All the working parts of the harness and box motion are either of wrought or malleable iron, and are case-hardened.

This loom meets a want long felt by woollen manufacturers; and has within the last three years been introduced into many of the best mills in the United States and Canada, and fully meets all which is claimed for it. We now have several hundreds of them in successful operation, and the demand for them rapidly increasing, which we are more fully prepared than ever to meet; and we are fully assured that it will maintain the position which it has already attained as foremost in the long list of looms manufactured in this or other countries, and for which the Centennial commission have awarded, in connection with the above report, two medals and two diplomas.

HAMILTON WOOLLEN MILLS, SOUTHBRIDGE, MASS.

A W A R D.

PRODUCT: Reps and Delaines.

A very handsome and complete assortment of three-quarters printed reps and delaines, in strong patterns and designs, adapted for general consumption, and at low prices.

J U D G E S.

JOHN L. HAYES.
ELLIOT C. COWDIN.
CHARLES LE BOUTILLIER.
CHARLES J. ELLIS.
J. D. LANG.
CONSUL GUSTAV GEBHARD.
THEODORE BOCHNER, JR.
HENRY MITCHELL.*

Dr. MAX WEIGERT.
LOUIS CHATEL.
CARL ARNBERG.
HAYAMI KENZO.
JOHN G. NEESER.
AUGUST BEHMER.
ALBERT DANINOS.

C L A I M.

Few, if any, of the great manufacturing industries of New England have had a more varied and eventful history than that of the Hamilton Woollen Company, of Globe Village, Southbridge, Mass.

The Globe Company was incorporated in 1814 for the manufacture of cotton and woollen cloth and yarn. In 1824, the broad power-loom was first introduced here, amid great opposition from the foreign male hand-loom weavers. About 1845, the leading stockholders of the company—now known as the Hamilton Woollen Co.—who had been the selling agents of the Amoskeag Mills, resolved upon the conversion of the Globe Mill into a worsted factory.

In 1851, fancy cassimeres took the place of broadcloths in the manufacture here; but the mill has come to be most widely known from its reps and delaines. These two fabrics form now the staple products of the Hamilton Company, who produce of them nearly a million pieces per annum.

The company has, from the first of its present management, taken great interest in the care of its operatives. In its provisions for their moral and intellectual welfare, the beautiful church and valuable library bear ample testimony; while the well-tilled lands and model-farm buildings of the corporation show as just an appreciation for necessary creature comforts for the community.

This company also received an award on printed cotton fabrics, the language of the judges being as follows: "Commended for novelties in design and neatness of execution, good coloring, good printing of their 'knickerbocker' percales and cambrics."

* Signing Judge.

FREDERICK BAARE, PATERSON, N. J.**A W A R D.****PRODUCT: Silk Goods.**

Commended for black figured silks, made in an improved and superior manner; also, for twenty-six inch millinery goods, of good manufacture.

J U D G E S.

JOHN L. HAYES.

ELLIOT C. COWDIN.*

CHARLES LE BOUTILLIER.

CHARLES J. ELLIS.

J. D. LANG.

Consul GUSTAV GEBHARD.

THEODORE BOCHNER, Jr.

HENRY MITCHELL.

Dr. MAX WEIGERT.

LOUIS CHATEL.

CARL ARNBERG.

HAYAMI KENZO.

JOHN G. NEESER.

AUGUST BEHMER.

ALBERT DANINOS.

Frederick Baare started in New York in 1852 (late firm of Baare & Geer, successors to J. Gross Garely & Co., established in 1845), manufacturing ladies' dress trimmings, ribbons, dress- and lining-silks, and velvets. Commenced weaving broad silks on power-looms in 1860 (factory at Schoharie, N. Y., moved to Paterson in 1870). By educating labor for the power-loom, and employing improved machinery, he succeeded early in competing with foreign markets.

The Centennial exhibits, all taken from stock of current goods, represented the following articles: Brocade dress- and fancy millinery-silks, umbrella serge, millinery faille, and necktie silk.

His make of silk handkerchiefs is favorably known.

Agent, G. WARREN GEER. Salesroom, 21 Mercer Street, New York.

* Signing Judge.

HADLEY COMPANY, HOLYOKE, MASS.

A W A R D.

PRODUCT: Cotton Yarns, Thread, and Twines.

An excellent display of warp yarns, shoe-threads, and seine and harness twines ; all of great evenness and beauty.

J U D G E S.

EDWARD ATKINSON.
HUGH WADDELL, JR.
EDWARD RICHARDSON.
A. D. LOCKWOOD.
CHARLES H. WOLFF.
SAMUEL WEBBER.*
GEORGE O. BAKER.
ISAAC WATTS.

W. W. HULSE.
DON ALVARO DE LA GANDARA.
ARNOLD GOLDY.
GUSTAV HERRMANN.
JOSEPH DASSI.
MENI RODRIGUES DE VASCON-
CELLOS.

The Hadley Company of Holyoke, Mass., was organized in 1863. The machinery was at first arranged for the manufacture of six-cord spool cotton exclusively.

For the past ten years, however, a large part of the product has consisted of three-cord thread ; and, the number of spindles having largely increased (now about 30,000), more than one-half of the product is at present used in the manufacture of fine yarns for warps for dress goods, for twisting with wool, — put up white or colored, in various shapes, — for fine cabled seine twines, for harness twines, and threads for hosiery manufacturers.

The finer numbers of yarn are made of long-staple cotton, combed on the Heilmann combing machines, now employed in all the best fine-spinning in England. Combed yarns of the same quality are used for the Hadley shoe-threads, which are largely used in place of linen and silk in the shoe manufacture. The same material is also used for threads put up specially for the manufacture of shirts, garments, corsets, ruffings, &c.

The usual range of numbers spun is from 20s. to 100s.

ARTHUR T. LYMAN, *Treasurer*, 17 Kingston Street, Boston.
WILLIAM GROVER, *Agent*, Holyoke, Mass.

* Signing Judge.

ASBESTOS PATENT FIBRE CO., CHATHAM MILLS, PHILADELPHIA, PA.

A W A R D.

PRODUCT : Asbestos Fibre and Fabrics.

Very superior fibre for steam packing, especially adapted to meet a present want in steam-joints ; excellent non-combustible paper, the first real success of the kind, as far as is now known ; water and steam-pipes, either for outside covering of iron pipes or for use in themselves for the transmission of water or steam. Commended for superiority in manufacture, non-expansion, non-contraction, very little friction, economy in prices and uses.

J U D G E S.

EDWARD ATKINSON.
HUGH WADDELL, Jr.
EDWARD RICHARDSON.
A. D. LOCKWOOD.
CHAS. H. WOLFF.*
SAMUEL WEBBER.
GEORGE O. BAKER.
ISAAC WATTS.

W. W. HULSE.
ARNOLD GOLDY.
DON ALVARO DE LA GANDARA.
GUSTAV HERRMANN.
JOSEPH DASSI.
MENI RODRIGUES DE VASCON-
CELLOS.

We make as specialities the following articles : —

Asbestos Patent Fibre Braid. — The champion non-conductor, to prevent radiation of heat and condensation of steam, as a covering for marine, stationary, or locomotive boilers, hot and cold water pipes.

Asbestos Patent Fibre Steam-Joints. — Manufactured of any thickness and size, cut ready for use for manholes, handholes, pipes, stills, retorts, blast furnaces, &c.

Asbestos Patent Fibre Packing. — The indestructible, expanding, contracting, and lubricating qualities of asbestos fibre are to-day universally recognized. We manufacture the packing in all sizes used, from $\frac{1}{8}$ inch to 3 inches in diameter ; square, round, and in circuit coils.

Asbestos Writing-Paper. — The paper is fire proof, smooth, flexible, and tough, and possesses all the qualities of the best writing-paper for records, account-books, legal paper, bonds indestructible by acid or fire.

* Signing Judge.

HOLLAND MANUFACTURING COMPANY, WILLIMANTIC, CONN.

A W A R D.

PRODUCT: Sewing Silk.

Commended for a fine assortment of sewing silks of different kinds; also, machine twist, highly meritorious for the excellent quality of raw material and the preparation for the various purposes; also, for silk spinning and silk thread-testing machines.

J U D G E S.

JOHN L. HAYES.
ELLIOT C. COWDIN.
CHARLES LE BOUTILLIER.*
CHARLES J. ELLIS.
J. D. LANG.
Consul GUSTAV GEBHARD.
THEODORE BOCHNER, Jr.
HENRY MITCHELL.

Dr. MAX WEIGERT.
LOUIS CHATEL.
CARL ARNBERG.
HAYAMI KENZO.
JOHN G. NEESER.
AUGUST BEHMER.
ALBERT DANINOS.

C L A I M.

HOLLAND MANUFACTURING COMPANY, WILLIMANTIC, CONN.

Salesrooms, New York, Boston, and Philadelphia.

This business was established in 1866, and the style Holland Manufacturing Co., adopted in 1872.

The company occupy two large mills at Willimantic, Conn.; one erected in 1865, the other in 1872. Perhaps no one in this country has done more to improve the quality of silk threads than did Goodrich Holland (one of the founders of this business).

The machinery throughout these Holland Mills is all new, and embraces substantially all the improvements that have been found of use in the production of silk threads, and there are probably no better equipped silk works in the country.

The Holland Manufacturing Co. make a specialty of ounce goods in machine twist for shoe manufacturers' use. To obtain a satisfactory thread for leather work, only first-class stock must be used; and the award given this company by the Centennial judges indicates that this question of raw material receives the attention its importance demands.

The Holland Company have also been pioneers in making clear modern methods of testing values in silk threads. Their facilities are unsurpassed; and, as they place their goods in the hands of the consumer direct, through their agents and travellers, intermediate expenses and commissions are saved.

* Signing Judge.

THE JOSEPH DIXON CRUCIBLE CO., JERSEY CITY, N. J.**A W A R D.****PRODUCT: Lead Pencils.**

Commended for the superior quality of pencils from American graphite; their smoothness, durability, and uniformity in various grades.

J U D G E S.

JAMES M. WILCOX.
C. O. CHAPIN.
WM. FAXON.
EDWARD CONLEY.

H. T. BRIAN.
SIR SIDNEY H. WATERLOW.
G. W. SEITZ.

THE DIXON CRUCIBLE COMPANY,

JERSEY CITY, N. J.

The pencil industry took a new start in the United States four years ago, when the Dixon Crucible Company added that article to the great variety of their productions. The company is the outgrowth of the old firm of Joseph Dixon & Co., established in 1827 for the manufacture of graphite or black lead crucibles. The Dixon crucibles drove the imported article from the American market, and found their way to Europe about 1850. In 1856, the sale reached an extent that rendered it desirable to have them made there; and the present Battersea Works, London, were started by the former English agents of Dixon & Co.

In 1858, the firm turned the business over to the Joseph Dixon Crucible Company, with a capital of \$750,000. The production of Dixon's American graphite pencils has already reached an average of 70,000 per day. The quality is not surpassed by any foreign pencil.

The company has an advantage in owning the only successful mines for fine graphite in America, at Ticonderoga, N. Y.; but the great success of the Dixon pencil is due to the use of machinery in place of hand labor, by means of which perfection and uniformity are attained.

SAWYER WOOLEN MILLS, DOVER, N. H.

A W A R D .

PRODUCT: Fancy Cassimeres and Suitings.

Fancy cassimeres and kerseys, in blacks and colors, of high intrinsic merit, free from cotton, shoddy, or flocks; the styles neat, and the prices, for the quality, low; the silk mixed, and the double and twist specially commended.

J U D G E S .

JOHN L. HAYES.
ELLIOT C. COWDIN.
CHARLES LE BOUTILLIER.
CHARLES J. ELLIS.*
J. D. LANG.
CONSUL GUSTAV GEBHARD.
THEODORE BOCHNER, Jr.
HENRY MITCHELL.

Dr. MAX WEIGERT.
LOUIS CHATEL.
CARL ARNBERG.
HAYAMI KENZO.
JOHN G. NEESER.
AUGUST BEHMER.
ALBERT DANINOS.

These mills are situated in Dover, New Hampshire, on the Bellamy Bank River,—the water-power of the three lower falls of which is controlled and utilized by this company, as is also the reservoir in Barrington, which was built in 1863–64, with a capacity of 363 acres. Tide-water reaches to the lower mill, and is navigable for coal-barges and sloops of a moderate capacity. The Portsmouth and Dover branch of the Eastern Railroad have a station at these mills, which is about sixty-six miles from Boston, the freight of which can be discharged directly into the warehouse which is attached to the mills. The Boston and Maine Railroad station is one and a half miles distant.

The works comprise two brick mills, with the necessary store-houses, &c., as follows:—

Lower Mill . . . 156 × 38; 3 stories and basement.

„ addition 25 × 50; 1 „ „ „

This mill is operated by a 40-inch Risdon turbine wheel, under a fall of 20 feet.

Upper Mill . . . 272 × 40; 3 stories and Mansard roof.

„ additions 80 × 30; 2 stories and basement.

„ „ 30 × 57; 2 „ „ „

„ „ 58 × 30; 2 „ „ „

„ „ 58 × 35; 1 „ „ „

Operated by two turbines; viz., 1 43-inch Risdon, fall 10 feet; 1,42-inch Houston, fall 12 feet; also, a Harris Corliss engine of 90-horse power.

* Signing Judge.

Two brick storehouses: 126×40 , 4 stories; 100×30 , 2 stories. Dry-house, repair shop, coal house, stable, agent's house, and fifty (50) tenements,—all substantially built, with slated roofs.

The mills are equipped with machinery of the latest and most approved patterns; are lighted with gas; have a complete fire apparatus, including sprinklers, and such other conveniences as pertain to a first-class concern.

The business was commenced, in 1823, by Alfred I. Sawyer; and was confined to the carding of rolls and cloth dressing, until 1832, when he discontinued that business, and commenced the manufacture of flannels, with one set of machinery, in a building suitable for the purpose, on the site now occupied by the Upper mill. He enlarged the building in 1837, and added another set of machinery. With these two sets, the business of manufacturing flannels was continued until 1858. In the mean time, the property had come into the possession of F. A. and J. Sawyer (Francis A. Sawyer, of Boston, and Jonathan Sawyer, of Dover), brothers of Alfred I. Sawyer, who died in 1849.

In 1858, the property below, known as the Moses Mill, was purchased. This was a brick mill, and was built and occupied as a paper-mill until 1855, when it was changed into a flannel-mill, with two sets of machinery. This mill was enlarged in 1860 to four sets; and again, in 1863, to eight sets. The old machinery has been replaced, and it is now a substantial and well-equipped mill. The old mill before mentioned as started in 1832 was continued in operation until 1872; when it was replaced by the present well-built structure, which contains twelve sets of machinery, with preparing and finishing machinery for both mills, or 20 sets.

Flannels were made until 1862, when the machinery was changed, gradually, until 1866; since then, attention has been entirely devoted to the manufacture of fine fancy cassimeres, cloths, and suitings, which have established for themselves a wide reputation.

An exhibit was made at the Centennial Exhibition at Philadelphia, for which the company was awarded a Medal and Diploma of merit (a copy of which is annexed hereto).

The mills were incorporated in 1873, with a capital of \$600,000. This amount of capital, with such surplus as is required, enables the company to sell their own goods, without the intervention of commission houses.

The corporation consists of the old firm of F. A. & J. Sawyer, and Charles H. Sawyer, the resident agent, who was admitted at the time of incorporation. For over half a century this establishment has flourished. It has weathered all the panics and financial storms that have occurred during the time, and with credit unimpaired.

WANSKUCK COMPANY, PROVIDENCE, R. I.

The United States Centennial Commission has examined the report of the judges, and accepted the following reasons, and decreed an award in conformity therewith.

REPORT ON AWARDS.

PRODUCT: Overcoatings.

Name and address of Exhibitor :

WANSKUCK COMPANY, PROVIDENCE, R. I.

The undersigned having examined the product herein described, respectfully recommends the same to the United States Centennial Commission for award, for the following reasons, viz. :—

A beautiful exhibit of fancy elysians and fur beavers, excellent in design and texture ; their Devonshire kerseys, in black and colors, especially commendable.

JOHN L. HAYES.

(Signature of the Judge.)

Approval of Group Judges.

ELLIOT C. COWDIN.

CHARLES LE BOUTILLIER.

CHARLES J. ELLIS.

J. D. LANG.

CONSUL GUSTAV GEBHARD.

THEODORE BOCHNER, Jr.

HENRY MITCHELL.

Dr. MAX WEIGERT.

LOUIS CHATEL.

CARL ARNBERG.

HAYAMI KENZO.

JOHN G. NEESER.

AUGUST BEHMER.

ALBERT DANINOS.

A true copy of the record :

FRANCIS A. WALKER,

Chief of the Bureau of Awards.

Given by authority of the United States Centennial Commission.

A. T. GOSHORN, *Director-General.*

J. R. HAWLEY, *President.*

J. L. CAMPBELL, *Secretary.*

The Wanskuck Company, whose mills are located in North Providence, R. I., was organized in 1864, with a capital of \$500,000. They run thirty sets of cards, and make a specialty of fine overcoatings, — elysians, beavers, kerseys, and ladies' coatings. No American goods of their class received higher commendation at the Exhibition, and their excellence is established by the preference given to them in our market over foreign goods. This company believes that there is no obstacle to a successful manufacture of their class of goods, except the high duty on foreign fine wools.

The officers of the company are : —

Treasurer.

H. J. STEERE.

Agent.

JESSE METCALF, Providence.

Selling Agents.

SWIFT, SACKETT, & Co., New York.

WORUMBO MANUFACTURING COMPANY, LISBON FALLS, ME.

A W A R D.

PRODUCT: Moscow Beaver Overcoatings.

Black and colored Moscow beavers, of excellent fabric, color, and finish.

J U D G E S.

JOHN L. HAYES.
ELLIOT C. COWDIN.
CHARLES LE BOUTILLIER.
CHARLES J. ELLIS.*
J. D. LANG.
CONSUL GUSTAV GEBHARD.
THEODORE BOCHNER, Jr.
HENRY MITCHELL.

DR. MAX WEIGERT.
LOUIS CHATEL.
CARL ARNBERG.
HAYAMI KENZO.
JOHN G. NEESER.
AUGUST BEHMER.
ALBERT DANINOS.

C L A I M.

This company organized in 1864, and built a first-class brick mill, completing it in the spring of 1865. During the first two years, the product consisted of ladies' sackings, tweeds, and black doeskins. The manufacture of these goods not proving profitable, that of Moscow beavers was taken up, with fair success from the start. From that time to this they have averaged fully seven-eighths of the entire product. The constant aim has been to maintain a uniform character and quality, and to produce the most satisfactory article at the lowest price in proportion to real value. For some years a Worumbo beaver has been recognized as a standard article in the trade.

The mill contains ten sets of cards and forty-one wide looms, producing of finished goods 150,000 yards 6-4 wide, weighing 280,000 pounds. About one hundred and eighty hands are employed, with an annual pay-roll of \$75,000.

The present organization is as follows:—

<i>President.</i>	<i>Treasurer.</i>
OLIVER MOSES, Bath, Me.	G. C. MOSES, Bath, Me.

Agent.
F. GUTMANN, Lisbon Falls.

Selling Agents.
LEWIS BROTHERS & Co., New York, Philadelphia, and Boston.

* Signing Judge.

ANDROSCOGGIN MILLS, LEWISTON, MAINE.

The United States Centennial Commission has examined the report of the judges, and accepted the following reasons, and decreed an award in conformity therewith.

REPORT O'N AWARDS.**PRODUCT: Cotton Fabrics.***Name and Address of Exhibitor:***ANDROSCOGGIN MILLS, LEWISTON, MAINE.**

The undersigned, having examined the product herein described, respectfully recommends the same to the United States Centennial Commission for award, for the following reasons, viz.:—

Commended for the excellence of their seamless bags, the even, smooth texture of their wide sheetings of the higher grade, and for the general uniformity of their fabrics.

ISAAC WATTS.

(Signature of the Judge.)

Approval of Group Judges.

EDWARD ATKINSON.
HUGH WADDELL, JR.
EDWARD RICHARDSON.
A. D. LOCKWOOD.
CHARLES H. WOLFF.
SAMUEL WEBBER.
GEORGE O. BAKER.

ARNOLD GOLDY.
W. W. HULSE.
DON ALVARO DE LA GANDARA.
GUSTAV HERRMANN.
JOSEPH DASSI.
MENI RODRIGUES DE VASCON-
CELLOS.

A true copy of the record:

FRANCIS A. WALKER,
Chief of the Bureau of the Awards.

Given by authority of the United States Centennial Commission.

A. T. GOSHORN, *Director-General.*
J. R. HAWLEY, *President.*

J. L. CAMPBELL, *Secretary.*

The Androscoggin Mills, situated in Lewiston, Maine, upon the Androscoggin River, may be referred to as one of the very best types of the modern cotton manufacturing establishments which mark the new epoch in the cotton fabrication of this country, which was coeval with the period of the late American war. The Androscoggin Mills were started under the quickening influences of that period, having been incorporated in 1860, and commencing operations in 1861, with a capital of \$1,000,000. For the constructions and machinery of this establishment, the experience of fifty years in the old centres in Massachusetts, New Hampshire, and Rhode Island, was availed of for guidance or warning; and the best engineering talent in the country was employed to construct machinery which American experience, enlightened by European observation, had pronounced to be most effective and economical.

The works of this establishment consist of three mills. No. 1 Mill is a brick structure, 600 feet long, and 75 wide, and four stories in height; with wings 100 feet long, 48 feet wide, and also four stories high. In this mill there are produced annually 7,900,000 yards of cotton fabrics, consisting of sheetings, shirtings, prints, and jeans. The perfection of machinery in this mill produces the smooth texture of the class of goods here made, which was specially observed by the judges at the Exhibition.

No. 2 Mill is 184 feet long, 74 feet wide, and three stories high. No. 3 Mill is 166 feet long, 74 feet wide, and three stories high. The two last-named mills are devoted entirely to the fabrication of an article peculiarly American in its origin and use, — seamless bags, — whose principal use is by the grain farmers of the transportation of wheat to the grain-depots on the rail stations; our Eastern factories thus rendering an incalculable service to Western agriculture. 42,000 seamless bags, weighing one pound each, are made in these two mills each week.

The Androscoggin Mills were incorporated in 1860, and commenced manufacturing in 1861; its capital stock is \$1,000,000; and the average monthly pay-roll is \$45,000; No. 1 fine mill contains 52,450 spindles, — 2 and 3 Bag Mill produce about 42,000 bags per week.

The mills consume 5,400,000 pounds cotton, 1,200 tons of coal, and seven tons of starch per year. The power is derived from seven turbine water-wheels, of 1,200 total horse-power, and one Corliss engine, 150-horse power. Gas-works were constructed on the corporation grounds in 1876.

The officers of the company are as follows : —

Agent.

WM. F. GOULDING.

Paymaster and Clerk.

A. P. WINSLOW.

Treasurer.

BENJAMIN E. BATES.

Directors.

THEOPHILUS W. WALKER.

LYMAN NICHOLS.

PETER T. HOMER.

JAMES M. BEEBE.

JOHN A. BLANCHARD.

A. D. LOCKWOOD.

Selling Agents.

WRIGHT, BLISS, AND FABYAN, Boston and New York.

BATES MANUFACTURING CO., LEWISTON, ME.

The United States Centennial Commission has examined the report of the judges, and accepted the following reasons, and decreed an award in conformity therewith.

REPORT ON AWARDS.

PRODUCT: Cotton Fabrics.

Name and address of Exhibitor :

BATES MANUFACTURING CO., LEWISTON, ME.

The undersigned, having examined the product herein described, respectfully recommends the same to the United States Centennial commission for award, for the following reasons, viz. :—

Commended for the general excellence in the style and design of their Marseilles and crochet quilts, and of their fancy woven white goods.

ISAAC WATTS.

(Signature of the Judge.)

Approval of Group Judges.

EDWARD ATKINSON.
SAMUEL WEBBER.
GEORGE O. BAKER.
JOSEPH DASSI.
ARNOLD GOLDY.
A. D. LOCKWOOD.
EDWARD RICHARDSON.

W. W. HULSE.
CHARLES H. WOLFF.
GUSTAV HERMANN.
HUGH WADDELL, JR.
MENI RODRIGUES DE VASCON-
CELLOS.
DON ALVARO DE LA GANDARA.

A true copy of the record :—

FRANCIS A. WALKER.

Chief of the Bureau of Awards.

Given by authority of the United States Centennial Commission.

A. T. GOSHORN, *Director-General.*

J. R. HAWLEY, *President.*

J. L. CAMPBELL, *Secretary.*

The city of Lewiston, in the State of Maine, situated upon the Androscoggin River, and commanding one of the most magnificent and available water-powers in the country, holds a high place among the great centres of the cotton manufacture in the United States. The rapidity of its growth, due to its characteristic industry, is marvellous. A village containing in 1850 scarcely eight hundred inhabitants has become a city with a population of thirty thousand, including its immediate suburbs. The pioneer establishment in the manufacture which has brought about this great result was the Bates Manufacturing Company, and its name indicates the individual whose energy and enterprise have materially contributed to the development of the cotton industry in this locality.

This company was incorporated in 1850, and organized in 1852, for the purpose of making cotton goods, with the following officers: Charles B. Shaw, President; Benjamin E. Bates, Treasurer; Silas Titcomb, Clerk. The capacity of the mill on starting was 16,000 spindles and 400 looms.

The projectors of this enterprise, as well as others in Lewiston, had the advantage of building upon the experience of the older manufacturing centres of Lowell, Manchester, and Rhode Island. At the commencement, they secured the services of the best practical manufacturers of Rhode Island, and subsequently were aided in their improvements by the experience and skill of one of the most eminent mechanical engineers in this country, or even abroad.

Unrestrained by the conservative ideas of the older manufacturing districts, they adopted new machinery, and essayed fabrics not before made in this country, on an extensive scale. Meanwhile they increased their machinery, until they now employ 56,196 spindles, 895 narrow and 101 broad looms, equal to 1,097 narrow looms. The capital stock of the company has been increased to \$1,500,000. In the cotton department, besides silesias and cottonades, which are produced in large quantities, they make Marseilles and crochet quilts, ginghams, cheviots, cotton-dress goods, skirtings, knitting, cotton and warp yarns, jeans, piques, linen checks, and Turkish and common towels, — indeed, almost the whole range of fancy woven cottons. In the production of these goods they have the advantage, of which the consumer partakes in the diminished price of his goods, of the exceedingly low cost of the construction of the mills, and of the cheap labor and subsistence peculiar to this locality.

This establishment is one of the few in this country which makes cotton and woollen goods; having a woollen mill, started in 1865, with eight sets of machinery and thirty looms, employed in the manufacture of Moscows, Elysians, Beavers, and Tricots, which have an excellent reputation in the market.

Selling Agents, WRIGHT, BLISS, & FAYAN, Boston and New York.

HILL MANUFACTURING COMPANY, LEWISTON, ME.

The United States Centennial Commission has examined the report of the judges, and accepted the following reasons, and decreed an award in conformity therewith.

REPORT ON AWARDS.

PRODUCT: Cotton Fabrics.

Name and Address of Exhibitor:

**HILL MANUFACTURING COMPANY,
LEWISTON, ME.**

The undersigned, having examined the product herein described, respectfully recommends the same to the United States Centennial Commission for award, for the following reasons, viz.:—

Commended for uniformity in the quality of their fabric.

ISAAC WATTS.
(Signature of the Judge.)

Approval of Group Judges.

EDWARD ATKINSON.
HUGH WADDELL, Jr.
EDWARD RICHARDSON.
A. D. LOCKWOOD.
CHARLES H. WOLFF.
SAMUEL WEBBER.
GEORGE O. BAKER.

ARNOLD GOLDY.
W. W. HULSE.
DON ALVARO DE LA GANDARA.
GUSTAV HERRMANN.
JOSEPH DASSI.
MENI RODRIGUES DE LA VAS-
CONCELLOS.

A true copy of the record:

FRANCIS A. WALKER,
Chief of the Bureau of Awards.

Given by the authority of the United States Centennial Commission.

A. T. GOSHORN, Director-General.
J. R. HAWLEY, President.

J. L. CAMPBELL, Secretary.

Of all the New England localities for mills, that of Lewiston seems to possess, in a permanent water-power, the most promising future. Its sources of water supply are so far beyond the reach of the destructive causes operating in many other prominent places, that they do not seem to be endangered. This argues well for the wisdom of the founders of the city, and for its future prosperity. Nature has made the place attractive, and the enterprise and benevolence of the capitalists who have made their investments here have supplemented her work by substantial buildings for factories and dwellings, and all the literary and moral agencies needed for an intelligent and progressive community.

This condition of the community has been continued and confirmed by the financial success, which from the start has been the history of Lewiston.

Among the first of the mills established here was that of the Hill Manufacturing Company, incorporated in 1850, and organized Sept. 15, 1852, by the election of the following officers:—

Directors, Homer Bartlett, T. J. Hill, I. N. Crehore, A. H. Kelsey, N. D. Whitney, Hamlin Blake, Benjamin E. Bates.

Treasurer, F. L. Richardson.

Clerk, Silas Titcomb.

The capital stock was \$350,000. Manufacturing was commenced in 1854, with 20,000 spindles, 464 looms on 36 to 40 in. goods, 80 and 92, No. 33 yarn. In June, 1855, the capital stock was increased to \$400,000; and in September, 1860, the company commenced the erection of a new mill, and increased the capital stock to \$700,000. Operations in Mill No. 2 were begun in 1864, and in September of the same year the capital was increased to \$1,000,000.

The company run at the present time 51,000 spindles, and 1,096 looms, on 36, 40, and 45 in. goods, 80 and 86, No. 34 yarn.

The 36 weigh	418
The 40 "	378
The 45 "	330

The annual product is 8,000,000 yards of shirtings and sheetings; consumption of cotton, 2,500,000 pounds; coal, 500 tons; employing 1,000 hands; the monthly pay-roll is \$28,000 per month. The power is four turbine wheels, 800-horse power.

The present officers are:—

J. G. COBURN	<i>Agent.</i>
FRED B. SANDS	<i>Clerk.</i>
F. L. RICHARDSON	<i>Treasurer.</i>

Directors.

B. E. BATES.
N. D. WHITNEY.
PETER T. HOMER.
F. L. RICHARDSON.

J. G. ABBOTT.
LYMAN NICHOLS.
MATTHEW BARTLETT.

F. L. RICHARDSON *Selling Agent.*

BARKER MILLS, AUBURN, ME.

The United States Centennial Commission has examined the report of the judges, and accepted the following reasons, and decreed an award in conformity therewith.

REPORT ON AWARDS.

PRODUCT : Cotton Fabrics.

Name and address of Exhibitor :

BARKER MILLS, AUBURN, ME.

The undersigned, having examined the product herein described, respectfully recommends the same to the United States Centennial Commission for award, for the following reasons, viz. :—

Commended for the special evenness of yarn and excellence of weaving in their brown and bleached fabrics.

ISAAC WATTS.

(Signature of the Judge.)

Approval of Group Judges.

EDWARD ATKINSON.
HUGH WADDELL, JR.
EDWARD RICHARDSON.
A. D. LOCKWOOD.
CHARLES H. WOLFF.
SAMUEL WEBBER.
GEORGE O. BAKER.

ARNOLD GOLDY.
WM. W. HULSE.
DON ALVARO DE LA GANDARA.
GUSTAV HERRMANN.
JOSEPH DASSI.
MENI RODRIGUES DE VASCON-
CELLOS.

A true copy of the record :

FRANCIS A. WALKER,
Chief of the Bureau of Awards.

Given by the authority of the United States Centennial Commission.

A. T. GOSHORN, *Director-General.*
J. R. HAWLEY, *President.*

J. L. CAMPBELL, *Secretary.*

.CLAIM.

It is a fact to be lamented, that while the mills of European manufacturing centres are largely owned by citizens resident at the factory sites, in this country the capitalists generally reside at distant points from the industries, and the management is largely by agencies rather than personal interest and supervision.

The Barker Mill is an exception to this rule. It was planned, built, and is owned and managed by resident citizens. Its success in its line of goods, widely known as the "Barker sheetings," as also its steady financial prosperity, are very largely due to the residence and constant personal supervision of the President, C. I. Barker, and the Superintendent, W. S. Rogers.

It is located in Auburn, Me., on the banks of the Little Androscoggin, and no river in Maine holds out through a drought better. The water-power of the company is estimated at 2,000-horse power. In 1870, a few enterprising gentlemen of Auburn and Lewiston bought three hundred and fifty acres of land (constituting some of the most beautiful and pleasant locations for residences that can be obtained on either side of the river), and commenced the erection of the Barker Mill,—a brick structure five stories high, three hundred feet long, and fifty feet wide. It was fitted up with the latest and best patterns of machinery, protected by all the approved fire preventives, so adjusted that each floor can be flooded without injury to other parts of the mill.

The company run 20,000 spindles, and are making the fine forty-inch sheetings to which has been given the name of the mill, each piece being thus stamped. Three hundred hands are employed, with a product of 3,000,000 yards per annum; consuming 1,900 bales of cotton, and 350 tons of coal. The gas used by the company is manufactured on the corporation, in works of sufficient capacity to supply the city of Auburn. The power is a Leffel turbine, under a head of thirty-six feet of water, which is in ample and uniform supply; the company controlling the same on both sides of the Little Androscoggin for one and a half miles.

The corporation is surrounded by three hundred fine tenement houses; and what in 1871 was a forest is now a thriving village of three hundred voters, and over one thousand inhabitants,—a notable illustration of what can be done by the use of capital, energy, and intelligence, when attended by interested local supervision.

C. I. BARKER	<i>President.</i>
A. M. PULSIFER	<i>Treasurer.</i>
W. S. ROGERS	<i>Superintendent.</i>

Directors, C. I. BARKER, J. R. PULSIFER, J. H. ROAK, A. M. PULSIFER, J. G. COOK, J. P. GILL, A. LELAND.

Selling Agents, WANTWORTH, CASE, & Co., New York, and Boston.

Capital stock, \$400,000.

PONEMAH MILLS, TAFTVILLE, CONN.

A W A R D.

PRODUCT: Cotton Fabrics.

Commended for the excellence of their extra fine printing cloths.

J U D G E S.

EDWARD ATKINSON.
HUGH WADDELL, Jr.
EDWARD RICHARDSON.
A. D. LOCKWOOD.
CHAS. H. WOLFF.
SAMUEL WEBBER.
GEORGE O. BAKER.
ISAAC WATTS.*

W. W. HULSE.
ARNOLD GOLDFY.
DON ALVARO DE LA GANDARA,
GUSTAVE HERMANN.
JOSEPH DASSI.
MENI RODRIGUES DE VASCON-
CELLOS.

The Ponemah Mills are located at Taftville, on the Shetucket River, about four miles above the city of Norwich, with a fall of thirty feet in the river, giving ample water-power, and, at the same time, close proximity to tide-water navigation. They owe their existence to the belief of their projector, Edward P. Taft, that the true way to promote the best interests of the cotton manufacturing industries of the United States was in a more diversified product, and a competition, not among home manufacturers, but with the various classes of imported fabrics. Holding these views, and desirous of realizing the beneficial results of their application, in October, 1865, the mill privilege, and about six hundred acres of land, lying on both sides of the Shetucket River, were purchased by Orray Taft & Co., of Providence, R. I., and operations for its development commenced. Solidity and permanence were aimed at in all the plans: and the entire superstructure of the building rests upon a heavy foundation, laid in cement; while the wheel-pit, 228 feet long, 61 feet wide, and 42 feet deep, was blasted out of the solid rock. The dam across the river is 418 feet long, 24 feet high, built of stone and cement, and has amply proved its strength by carrying on its roll-way the pressure of more than ten feet depth of water. In 1867, a charter was obtained; and in December, 1869, a company was organized, under the name of the Orray Taft Manufacturing Company, with a capital of \$1,500,000; comprising among its stockholders many of the prominent capitalists of Norwich, Providence, and Boston. In July, 1871, the name of the corporation was changed to its present one, — "The Ponemah Mills." The completion of the buildings, and the arrangement of the machinery were finished, and the mill started, in November, 1871. The main building is of brick,

* Signing Judge.

with freestone trimmings, 750 feet long, 75 feet wide, four stories high, with a Mansard roof; giving five full floors, or more than six acres of flooring available for machinery. The fourth story, 19 feet high, used for a mule room, with 38,000 spindles in one room, and without a column or partition to interrupt the view, is, probably, without exception, the largest single room in the world used for manufacturing purposes. An ell building in the rear, and running at right angles from the centre of main building, is erected over the wheel-pit and raceway, 228 feet long, 61 feet wide, and contains the preparatory machinery. At present, the mill contains 80,000 spindles (the total capacity of building being about 110,000 spindles), and has running 1,672 looms; the entire water-power is estimated at from 125,000 to 150,000 spindles. While solidity was the main aim, yet architectural proportions were not overlooked; and the whole establishment is said to be, by competent judges, the finest single cotton mill in the world.

From its inception it was intended to manufacture the finer fabrics, like lawns, cambrics, and other goods at that time largely imported; and the large pecuniary interest, which gentlemen connected with the Pacific Mills took at its organization determined at once the future product, and enabled the mills from the first start to make a favorable reputation for its goods. "Pacific Percales" took the lead; and while others imitated, yet they were far behind; and soon the importation of all the foreign cambrics and percales, except a few novelties, ceased; and the American market was supplied by the home manufacture. As times grew worse, and stern economy compelled retrenchment, a less expensive fabric was demanded, and the Cretonne cloth, combining the essential merits of the percale cloth, with the requisite cheapness, was at once furnished by the mills, and took the market. While full credit is due to the taste and execution shown in the printed design and beautiful finish, yet the mills are entitled to a portion of the reputation gained by these now popular fabrics for the perfection of the cloth. Other fine goods, such as Victoria lawns, Nainsook checks and stripes, cotton Italian cloths, satteens, cambric muslins, and cord jaconets are made successfully at the Ponemah; and at all times the aim of its managers has been rather to drive out the foreign fabrics than to undermine the structure of our own manufactures by a ruinous competition. The success of these mills in producing cloths which have thus speedily taken the popular demand is due in no small degree to the management at the mills, and especially to the thorough and competent supervision of its agent, James S. Atwood, who from the commencement has had the immediate charge of the mechanical and manufacturing departments, and whose ability as a practical manufacturer is too well known to the manufacturers of New England to need any further mention.

Officers of the Company.

JOHN F. SLATER, *President.*
JAMES S. ATWOOD, *Agent.*

EDWARD P. TAFT, *Treasurer.*

Directors, JOHN F. SLATER, JOHN C. WHITIN, L. BLACKSTONE, JAMES L. LITTLE, MOSES PIERCE, JAMES S. ATWOOD, EDWARD P. TAFT.

WAUREGAN MILLS, WAUREGAN, CONNECTICUT.

The United States Centennial Commission has examined the report of the judges, and accepted the following reasons, and decreed an award in conformity therewith.

REPORT ON AWARDS.

PRODUCT: Cotton Fabrics.

Name and Address of Exhibitor:

WAUREGAN MILLS, WAUREGAN, CONNECTICUT.

The undersigned, having examined the product herein described, respectfully recommends the same to the United States Centennial Commission for award, for the following reasons, viz. :—

Commended for the special merit of their fabrics, known as the "Wauregan Hundreds."

ISAAC WATTS.

(Signature of the Judge.)

Approval of Group Judges.

EDWARD ATKINSON.
SAMUEL WEBBER.
GEORGE O. BAKER.
JOSEPH DASSI.
ARNOLD GOLDY.
A. D. LOCKWOOD.
EDWARD RICHARDSON.

W. W. HULSE.
CHARLES H. WOLFF.
GUSTAV HERMANN.
HUGH WADDELL, Jr.
MENI RODRIGUES DE VASCON-
CELLOS.
DON ALVARO DE LA GANDARA.

A true copy of the record :

FRANCIS A. WALKER,
Chief of the Bureau of Awards.

Given by authority of the United States Centennial Commission.

A. T. GOSHORN, *Director-General.*
J. R. HAWLEY, *President.*

J. L. CAMPBELL, *Secretary.*

The Wauregan Mills are located at Wauregan, on the Quinebaug River, in the town of Plainfield, Windham County, Connecticut; and were started in 1853, by a corporation, organized with a capital of \$200,000, by a number of capitalists residing in Providence, R. I., for the purpose of erecting a mill especially adapted for making fine bleached shirtings. Orray Taft was President; Moses B. Lockwood, Treasurer; and Amos D. Lockwood, Agent at Wauregan. Under the immediate supervision of the Messrs. Lockwood, the company erected their first mill of 10,000 spindles; and were quite successful in introducing their fine goods, which at once gained a high reputation in the market. In the spring of 1858, owing to the ill-health of Moses B. Lockwood, Messrs. Lockwood resigned their position as managers, and the management of the company passed to the firm of Orray Taft, & Co., as Treasurers, and to James S. Atwood, as Agent; in whose control it has since continued. In 1859, the capital was increased to \$500,000, and an addition to the mill of 13,000 spindles erected: making a mill 508 feet long, 49 feet wide; capacity, 23,000 spindles, 508 looms. From 1860 to 1866, this company was one of the most successful; dividing to its stockholders, from its profits, its entire capital, and retaining also a handsome surplus.

In 1866 and 1867, the capital was further increased to \$600,000; a new mill, of 30,000 spindles, built; and the entire property overhauled and renovated. The mills are built in form of letter H; the two parallel buildings being each 508 feet long, and connected by a building over the canal between them 150 feet long. The entire capacity is 60,000 spindles, 1,300 looms; the power is furnished by four Jounval turbines, eight feet in diameter, and an auxiliary Corliss engine, of 250-horse power. Surrounding the mill is a neat village, owned by the company, with a beautiful Gothic church, a highly cultivated country; and the whole appearance of the property indicates prosperity, and a kindly care for the moral and spiritual welfare of the operatives.

The products of the mills have been, at different times, print cloths, fine percale cloths, cord jaconets, umbrella cloths, Victoria lawns, and cambric muslins; but especial attention has been paid to the manufacture of fine bleached goods for the best class of shirt-makers and retail trade; and their success has been fully shown, not only by the goods as shown in the Exposition, but by the high appreciation which the "Wauregan Hundreds" have received in the English market, and especially from the largest retail houses of Manchester and London. Their new style "Shirt Cottons," just introduced, are believed to possess more real value for wear than any other make of fine shirting.

Messrs. Lewis Brothers & Co., in Boston, New York, and Philadelphia, are the company's selling agents.

Officers of the Company.

TRUMAN BECKWITH, <i>President.</i>	ORRAY TAFT, & CO., <i>Treasurer.</i>
EDWARD P. TAFT, <i>Secretary.</i>	JAMES S. ATWOOD, <i>Agent.</i>

Directors, TRUMAN BECKWITH, W. J. KING, RESOLVED WATERMAN, SETH PADBELLFORD, EDWARD P. TAFT, JAMES S. ATWOOD, CHARLES F. MASON.

LIPPITT WOOLEN CO., WOONSOCKET, R. I.**A W A R D.****PRODUCT: Overcoatings and Fancy Cassimeres.**

A good exhibit of all-wool fancy elysians and fur beavers, of varied patterns and colors, in low and medium grades.

J U D G E S.

JOHN L. HAYES.
 ELLIOT C. COWDIN.
 CHARLES LE BOUTILLIER.
 CHARLES J. ELLIS.*
 J. D. LANG.
 CONSUL GUSTAV GEBHARD.
 THEODORE BOCHNER, Jr.
 HENRY MITCHELL.

Dr. MAX WEIGERT.
 LOUIS CHATEL.
 CARL ARNBERG.
 HAYAMI KENZO.
 JOHN G. NEESER.
 * AUGUST BEHMER.
 ALBERT DANINOS.

C L A I M.**THE LIPPITT WOOLEN CO., WOONSOCKET, R. I.**

On the site of the present mill there was built in 1827 what was known as the Harrison Cotton Mill, which was burnt and rebuilt in 1836, retaining its name until 1865, when it passed into the hands of the present company, who with twenty sets of machinery commenced the manufacture of fancy cassimeres and elysian overcoatings.

Mr. David Ballou was the first treasurer of the mill, and was succeeded in 1866 by Mr. Charles H. Merriman, the present treasurer of the company. The mills produce a million yards of goods per annum, and consume 1,200,000 pounds of fleece wool. They are a standard all-wool class of fabrics, adapted for general consumption.

The mill bears the name of one of our most widely-known and successful manufacturers, Ex-Governor Lippitt, of this State, who is prominently identified with so many of our leading industries.

The mill has secured a reputation for solid, well-made goods, at low prices, which it is the intention to retain and extend among the large consumers of the country.

* Signing Judge.

SOCIAL MANUFACTURING CO., PROVIDENCE, R. I.

A W A R D.

PRODUCT: Silesias.

Commended for the variety of colors as being very remarkable; also, for the evenness of the fabrics; admirable in both respects.

J U D G E S.

EDWARD ATKINSON.
HUGH WADDELL, Jr.
EDWARD RICHARDSON.
A. D. LOCKWOOD.
CHARLES H. WOLFF.
SAMUEL WEBBER.*
GEORGE O. BAKER.
ISAAC WATTS

W. W. HULSE.
DON ALVARO DE LA GANDARA.
ARNOLD GOLDY.
GUSTAV HERRMANN.
JOSEPH DASSI.
MENI RODRIGUES DE VASCON-
CELLOS.

C L A I M.

THE SOCIAL MANUFACTURING COMPANY,

PROVIDENCE, R. I.

These mills, which in their lines of manufacture have confined themselves to specialties, were able to place at the Exposition the most attractive goods, and secure the most unqualified commendation. The two qualities most essential in the special fabric of this mill — color and even quality — are characterized in their award as “admirable.”

The company was organized in 1855, with a capital of \$600,000, for the special manufacture of fine cotton fabrics. There are now running in the No. 1 Mill 50,000 spindles; and, in Mill No. 2 (the Globe), 40,000 spindles. Plain and twilled cottons, of fine and medium grades, are the chief products. The capital of the company is \$1,000,000.

Treasurer.
HENRY LIPPITT.

President.
CHARLES NOURSE.

* Signing Judge.

SILVER SPRING BLEACHING AND DYEING CO., PROVIDENCE, R. I.

A W A R D.

PRODUCT: Process of Dyeing Cotton Fabrics.

Commended for dyeing and finishing; great variety of plain and varied colorings, silesias, jaconettes, curtain hollandes, beetled and silk imitations; the exhibit altogether is a triumph in its way; also, for the excellence in bleaching and finishing white goods.

J U D G E S.

EDWARD ATKINSON.
HUGH WADDELL, Jr.
EDWARD RICHARDSON.
A. D. LOCKWOOD.
CHARLES H. WOLFF.
SAMUEL WEBBER.
GEORGE O. BAKER.

ISAAC WATTS.
W. W. HULSE.
DON ALVARO DE LA GANDARA.
GUSTAV HERRMANN.
JOSEPH DASSI.
MENI RODRIGUES DE VASCON-
CELLOS.

C L A I M.

The Silver Spring Bleaching and Dyeing Company was organized in 1864. Its capital is \$400,000. This company purchased the old Silver Spring Bleachery, that was started about 1850, as a nucleus for its present works. It is now the largest general finishing establishment in the State, having a capacity for dyeing and finishing 20,800,000 yards of colored goods, and of bleaching and finishing 15,600,000 yards of white goods, per annum. Its works are situated on Charles Street, in the city of Providence, R. I., within a mile and a half of its business centre. All the main buildings are of brick. They furnish excellent storage facilities for brown and finished goods. Over one and five-eighths acres of ground are enclosed by the walls of its buildings.

The company's city office is at 37 Weybosset Street, and is connected with the works by a private telegraph-wire. A telephone brings them within speaking distance of each other at all times. The company takes its name from the remarkably large and pure springs for which its neighborhood is noted. This spring water filters through a natural strata of the finest sand some twenty feet under ground. It is exceptionally soft and pure. Repeated analyses prove it to be unexcelled for bleaching and dyeing. It is collected in immense reservoirs, from eight to eighteen feet deep, and from which all surface

* Signing Judge.

water is excluded. The supply is more than sufficient for the whole works. In addition, West River flows for four-fifths of a mile through the company's estate, and it is the sole owner of Leonard's Pond. The works contain eight friction and five plain calenders, four sections of beetles, five large sets, and one small set of drying cans, two large tenter frames, thirty jigs, eleven dyeing machines, seven washing machines, and accessory machinery in proportion. This machinery is comparatively new and in the most excellent order. These facilities have enabled them to produce the best work, in the various styles of silesias, jaconettes, curtain hollands, wigans, plain prints, satteens, serges, beetled finished goods, elastic finished goods, fine and medium grades of bleached goods, &c., &c.

Printing machinery has been purchased, and will be set up immediately, for finishing sleeve linings. This company has always made a specialty of brilliant colorings. They are now producing a genuine Turkey red, much superior to the noted Cardinal red; and arrangements are completed for printing upon this color a fast blue, green, yellow, black, and pink, and also a clear white, equal in all respects to the colors produced at the famous Steiner's works in England. This is the only general finishing establishment in the country that produces these colors and combinations.

Included in their exhibit at the Centennial Exhibition were the goods of several other corporations, which had been bleached, colored, and finished at the Silver Spring. The awards they received are given below. They are virtually in addition to the general award at the head of this article, and show that in specialties as well as generally the work of the Silver Spring was highly commended by the judges.

President.

HENRY LIPPITT.

Treasurer.

| CHARLES WARREN LIPPITT.

PUTNAM MANUFACTURING Co., Providence, R. I. — Colored cotton goods.

Report. — Colored curtain hollands a specialty; great variety and novelty of design; colors remarkably good; blue mottled, new and admirable, fabric excellent.

PEABODY MILLS, Providence, R. I. — Colored cotton goods, prints, and colored suitings.

Report. — Commended for superiority of fabric, smoothness, economy, and adaptation; colors clear and well defined, and in very large variety. Also, for non-fading qualities of colors.

SOCIAL MANUFACTURING Co., Providence, R. I. — Silesias.

Report. — Commended for the variety of colors as being very remarkable; also for the evenness of the fabrics; admirable in both respects.

MANVILLE Co., Providence, R. I. — Fine bleached cotton fabrics.

Report. — Commended for the peculiar excellence of the fine bleached shirting.

GEORGE DRAPER & SON, HOPEDALE, MASS.**A W A R D.**

PRODUCT: Spinning Frame and Twister with the Sawyer Spindle; Improved Spools, Warper, and Creel; Spindle; Double Adjustable Rings.

Commended for variety of machines, with originality of invention, excellence in quality, utility, and fitness for the purpose intended, economy of power and labor, and excellence of work produced.

J U D G E S.

EDWARD ATKINSON.
HUGH WADDELL, JR.
EDWARD RICHARDSON.
A. D. LOCKWOOD.
CHARLES H. WOLFF.
SAMUEL WEBBER.
GEORGE O. BAKER.
ISAAC WATTS.

W. W. HULSE.
DON ALVARO DE LA GANDARA.
ARNOLD GOLDY.
GUSTAV HERRMANN.*
JOSEPH DASSI.
MENI RODRIGUES DE VASCON-
CELLOS.

Ruskin, who is in many respects the most eminent living æsthetic authority, affirms that "reason and experience alike teach the immense influence, for success or failure, exerted upon us, in all industrial as well as other activities, by our environments. Mechanical genius largely feels the inspiration of pleasant surroundings in nature and art; and the wits of men are sharpened greatly by such favoring circumstances."

Practical illustrations are not wanting, at home or abroad, of this truth. Conspicuous in England is Saltaire, the creation of Sir Titus Salt; while in America, among many others, the works of the Cheneys', at South Manchester, Conn., and the Fairbanks family, at St. Johnsbury, Vt., are notable examples. Accepting this reasoning as correct, it may be one of the favoring influences that has made the beautiful vale of Hopedale for thirty years a hive of successful invention and manufacture.

Messrs. Draper & Sons, whose industries are here located, have been, with their predecessors, engaged for sixty years in the manu-

* Signing Judge.

facture, introduction, and sale of improvements in cotton machinery. These inventions extend to nearly every branch of cotton manufacture. They have undoubtedly owned, or had the management of, more useful patents in this direction than any other concern in the country. Among others may be mentioned the Draper revolving temple, the best of its day (now superseded by the Dutcher temple, which commands the entire market of this country); the parallel shuttle motion; the Thompson oil-can, which has maintained its supremacy over numerous rivals for more than twenty years; the eveners, for railway heads; the shuttle-guide let-off motion, and thick-and-thin preventer for looms; the first self-oiling steps and bolsters for spinning; and the Sawyer spindle, proved by many actual tests, and acknowledged by competent judges, to be the best in operation. Thus this enumeration might be largely extended.

An exhibition of some of these inventions and improvements, made at the late International Exposition, not only secured the award herewith, but special mention, in the official report of Group Eight, from the Chairman, Isaac Watts, Esq., of England, which says:—

“Messrs. George Draper & Sons, of Hopedale, Mass., contributed their double adjustable spinning rings, loom temples, from the Dutcher Temple Company; a ring spinning-frame, with the Sawyer spindle; a twister, with a spindle on the same principle; a spooler, with the Wade bobbin-holder; and a warper, with a combination of stop-motions. These rings and temples are well known in the American cotton mills, the Messrs. Draper having supplied nearly, if not quite, all the temples used in the United States for many years; while the Sawyer spindle, which recent trials have shown to be capable of producing more yarn in the same time than the ordinary form of ring spindle, with a saving, in addition, of the power consumed, may be safely classed as an invention of great merit and utility. The Wade bobbin-holder is also coming rapidly into use, and giving entire satisfaction wherever introduced. The warper is being practically tested in many places. As a whole, the exhibit of the Messrs. Draper shows a great number of novelties of invention.”

The location of the works of Messrs. Draper is situated in the southwestern part of Milford, Mass., and comprises some six hundred acres of land along the valley of Mill River, — one of the tributaries of the Blackstone. It was settled about the year 1700, by John Jones, of Mendon, and remained for over a century the property of himself and descendants.

In 1841, it was purchased by Rev. Adin Ballou, in behalf of the

then recently formed Hopedale Community. The valley was at that time known as the Dale, — to which, as suggestive of great anticipations, the word "Hope" was prefixed. The society was a joint-stock organization, the individual property consisting simply of homesteads and some few personal investments. In March, 1856, after a practical experience of nearly fifteen years, the community, as an industrial institution, ceased to exist, by vote of its stockholders; the smaller ones being reimbursed, to a large extent, by those better able to bear their losses.

At this time its manufactories comprised a one-story machine shop, 20×40 feet, and two-story cabinet shop, 40×30 , with sheds and outbuildings. The business of the former was continued by E. D. Draper, George Draper, and J. B. Bancroft, under the name of the Hopedale Machine Company, William F. Draper afterwards succeeding the first-named; and by them the present stock-company was organized, in 1867. Having outgrown their old accommodations, they now occupy, in addition, a three-story building, 66×150 , with boiler-house and blacksmith-shop, 40×70 . The cabinet-shop was purchased by W. W. Dutcher & Co., comprising W. W. Dutcher, George Draper, and E. D. Draper, for the manufacture of Dutcher's patent-loom temples, the inventor of the same having moved here in May, 1856. This building has been enlarged to nearly double its original capacity, the business being now conducted by the Dutcher Temple Company, incorporated in 1867.

In addition to the above, the Hopedale Furnace Company have a foundry building, 80×70 ; also, necessary pattern-houses, shipping-house, &c. George Draper & Son's Spinning Ring and Oiler Works are located near by, as well as the counting-room occupied by all the companies. They are joint-owners of a commodious boarding-house, and about forty tenements that will compare favorably with those of any similar village in New England. In all the shops there are employed about three hundred persons.

Nature has been lavish in the beauties of the spot, and the moral and material prosperity of the village combine with her to make it in all respects a Model Industry.

DAVOL MILLS, FALL RIVER, MASS.

The United States Centennial Commission has examined the report of the judges, and accepted the following reasons, and decreed an award in conformity therewith.

REPORT ON AWARDS.

PRODUCT: Cotton Fabrics.

Name and Address of Exhibitor :

DAVOL MILLS, FALL RIVER, MASS.

The undersigned, having examined the product herein described, respectfully recommends the same to the United States Centennial Commission for award, for the following reasons, viz. :—

Commended for the superior quality of their serge twilled lining fabric, fine honey-comb cloaking, sateens and striped piqué.

ISAAC WATTS.

(Signature of the Judge.)

Approval of Group Judges.

EDWARD ATKINSON.
HUGH WADDELL, JR.
EDWARD RICHARDSON.
A. D. LOCKWOOD.
CHARLES H. WOLFF.
SAMUEL WEBBER.
GEORGE O. BAKER.

ARNOLD GOLDY.
W. W. HULSE.
DON ALVARO DE LA GANDARA.
GUSTAV HERRMANN.
JOSEPH DASSI.
MENI RODRIGUES DE VASCON-
CELLOS.

A true copy of the record :

FRANCIS A. WALKER,
Chief of the Bureau of Awards.

Given by authority of the United States Centennial Commission.

A. T. GOSHORN, *Director-General*
J. R. HAWLEY, *President.*

J. L. CAMPBELL, *Secretary.*

One of the best illustrations we have of the readiness of the American mind to seize upon even the most unpromising circumstances, and make them available for profitable use, is seen in the manufactories of Fall River, Mass.

Twenty years ago, had any one prophesied its position to-day as the first cotton-manufacturing locality of this country, he would have been deemed a fit subject for a lunatic asylum. The success achieved is due to two causes: the possession of large local capital, in the hands of men of great energy and enterprise; and the public-spirited determination that the resources thus possessed should be employed *at home*, under the personal supervision of its owners. From the first, a few men have originated, executed, and controlled the improvements. They have shown great public spirit in their buildings for manufacture and residence, and in their interest for the material and moral welfare of their employes. They have presented the noblest example in our manufacturing annals, in dealing firmly but justly with the problems arising from questions of labor and compensation. No better goods from any quarter are put upon the market than those from their mills; and to-day they occupy the proud position of being the first to carry American fabrics not only to China, India, and Brazil, but into the markets of England, France, and Italy. No one mill has a better record in these particulars than that whose award has been given above.

The Davol Mills are located at Fall River, Mass. They were incorporated in 1867 under the present name, with a capital stock of \$270,000, for the purpose of manufacturing fine shirtings, sheetings, silerias, and fancy cottons. In 1871, the goods becoming so popular that the mill was unable to supply the demand, and the stockholders by a unanimous vote decided to increase the size of the mills from 15,000 to 30,000 spindles, the present capacity of the mills.

President.

WILLIAM C. DAVOL.

Directors.

WM. C. DAVOL.
F. S. STEVENS.
C. P. STICKNEY.
JONATHAN SLADE.
F. H. STAFFORD.

JOHN P. SLADE.
E. E. HATHAWAY.
W. W. STEWART.
W. C. DAVOL, JR.

Treasurer.

W. C. DAVOL, JR.

RENFREW MANUFACTURING COMPANY, SOUTH ADAMS, MASS.

The United States Centennial Commission has examined the report of the judges, and accepted the following reasons, and decreed an award in conformity therewith.

REPORT ON AWARDS.

PRODUCT: Gingham and Skirtings.

Name and Address of Exhibitor:

RENFREW MANUFACTURING COMPANY,
SOUTH ADAMS, MASS.

The undersigned, having examined the product herein described, respectfully recommends the same to the United States Centennial Commission for award, for the following reasons, viz.:—

Commended for assortment having harmony and fastness of colors, good styles, and delicate shadings; chènè style especially good; gingham of soft, smooth fabric, well colored and harmonized; fine gingham, 80 by 72, well woven and smooth; twills, soft finish, fine assortment, of good colors and durable, black and white peculiarly, good in all respects.

ARNOLD GOLDY.

(*Signature of the Judge.*)

Approval of Group Judges.

EDWARD ATKINSON.
HUGH WADDELL, Jr.
EDWARD RICHARDSON.
A. D. LOCKWOOD.
CHARLES H. WOLFF.
SAMUEL WEBBER.
GEORGE O. BAKER.

ISAAC WATTS.
W. W. HULSE.
DON ALVARO DE LA GANDARA.
GUSTAV HERRMANN.
JOSEPH DASSI.
MENI RODRIGUES DE VASCONCELLOA.

A true copy of the record:

FRANCIS A. WALKER,
Chief of the Bureau of Awards.

Given by the authority of the United States Centennial Commission.

A. T. GOSHORN, *Director-General.*

J. R. HAWLEY, *President.*

J. L. CAMPBELL, *Secretary.*

The Renfrew Manufacturing Company has its establishment in South Adams, Mass. It was organized in 1867, with the following officers : —

L. L. BROWN *President.*

JAMES C. CHALMERS *Treasurer.*

JAMES RENFREW, Jr. *Agent.*

The company started operations with 216 looms, which were employed in the weaving of gingham. In 1870, they added 346 looms, and commenced the manufacture of cotton dress goods and fine chevots and skirtings, at the same time undertaking the manufacture of the very highest and finest qualities of gingham, which have competed effectively with the Scotch gingham, thereby curtailing the importations. In these goods they have aimed to produce harmony and fastness of colors, softness and smoothness of fabric, and the most delicate shadings. How well they have succeeded is sufficiently shown by the award which they received at the Exhibition.

They also make the finest qualities of colored, chènè, and fancy warps, which are employed by the manufacturers of woollen cloths for cassimeres, repellents, and dress goods, making a specialty of these. This establishment has also made a specialty of the fabrication of the celebrated "Turkey red" yarns, which until recently could only be obtained abroad. We claim to make as brilliant and fast a color as the imported. The capacity of their mills is 27,000 spindles, 10,000 of which are employed in the fabrication of fancy warps.

Wright, Bliss, & Fabyan, New York City and Boston, are the Selling Agents of the company.

OFFICIAL REPORTS ON TEXTILES
TO THE
INTERNATIONAL EXHIBITION AT PHILADELPHIA.

GROUP VIII.

*Cotton, Flax, Jute, &c., and Fabrics of the same, with Woven
Fabrics of Mineral Origin.*

REPORT OF ISAAC WATTS, *Chairman.*

REPORT OF EDWARD ATKINSON ON AMERICAN COTTON AND
COTTON MANUFACTURES.

REPORT OF SAMUEL WEBBER ON TEXTILE MACHINERY.

REPORT OF SAMUEL WEBBER ON LINENS.

GROUP IX.

GENERAL REPORT BY JOHN L. HAYES :—

PART I. WOOL.

PART II. WOOLLENS.

PART III. SILK AND SILK FABRICS.

WITH APPENDIX.

GROUP XIII.

Paper, Stationery, Printing, and Book-making.

REPORT BY JAMES M. WILCOX, *Chairman.*

REPORT OF THE CHAIRMAN OF GROUP No. 8.

PHILADELPHIA, Oct. 28, 1876.

GENERAL FRANCIS A. WALKER,
Chief of Bureau of Awards, Centennial Exhibition.

SIR, — The judges constituting Group 8, of which I was the President, having completed their labors, I have the honor to submit to you the following report. They were charged with the examination of the exhibits in Classes 228, 229, 665, 666, 230, 231, 232, 233, 234, 521, 523, 524; and, for the more efficient performance of their onerous duties, the group was divided into sections, each consisting of three or more judges, and every section undertaking the examination of the exhibits in those classes with which the members composing it were most familiar.

Class 228. — This class comprised woven fabrics of mineral origin. The exhibits were numerous and excellent, though in some of them there appeared room for much improvement as regards ornamentation. The wire-cloths, sieve-cloths, wire-screens, and bolting-cloths were, as a whole, highly creditable, and deserving of commendation, both on account of the taste and economy displayed in their production. The garden ornaments were graceful, and well adapted to different varieties of climate. The wire fabrics for manufacturing purposes comprised several novel improvements. Amongst these may be mentioned the wire fire-proof lath, serving as a base for ordinary mortar plastering, or for asbestos covering; meeting, to some extent, a much-felt want for the purpose of rendering buildings thoroughly fire-proof, and thus providing a bulwark against the rapid spread of the devouring element. *The asbestos fibre and fabrics* deserve special mention; as, both on account of their variety and practical uses, they surpass any thing exhibited on previous occasions. For steam-packing, steam-joints, roofing, pipe-covering, and other purposes where excessive heat or fire has to be overcome, the material

appears to have been successfully utilized. Wood covered with asbestos, moistened with water or other liquid, and hardened by exposure to the atmosphere, seems able to defy the action of fire; whilst, from its properties of toughness, elasticity, and non-conduction of heat, as well as on account of its cheapness, it appears likely to be of great utility. As a covering for pipes used for the transmission of water or steam, its practical value will attract increasing attention; whilst, as a material for the production of non-combustible writing-paper, it may prove to be of considerable advantage where the preservation of private or public documents is important. This remarkable mineral product is found extensively distributed over the world, and is obtained in quantities from Italy, Germany, Switzerland, Canada, California, Pennsylvania, Maryland, Carolina, Vermont, Maine, Virginia, Texas, &c.

Class 229.—Coarse fabrics, of grass, rattan, cocoa-nut, and bark. The Exhibition is remarkably rich in these exhibits; and the display was in all respects most satisfactory. The various, novel, economical, and useful articles of rattan deserve special notice; whilst the grasses and barks, in fibre and fabrics, evince considerable progress, and indicate the wonderful expansion in this direction which may yet be expected. In *matting*s, — Chinese, Japanese, palm-leaf, grass, and rushes; floor-cloths of rattan, cocoa-nut fibre, aloe, &c., — it was satisfactory to observe the thorough blending of the artistic and the useful. There is, however, a vast field yet to be explored in the collection of the different varieties of these fibres, and in the employment of more of them in each fabric, as well as in the invention of machinery suitable for the purpose. This may be encouraged by the increased demand likely to arise for floor-cloth, matting, &c., on sanitary grounds, — especially in the heated miasmatic regions of America and elsewhere.

Class 665.—Raw cotton, ginned, &c. In this class, there was scarcely any foreign competition, the cottons exhibited being almost entirely of American growth. Brazil, indeed, furnished, in small bales, some excellent specimens of the

various descriptions produced in that empire, known as Pernambuco, Paraiba, Santos, Bahia, Maranhão, and Maccio cotton. From India, two bales, of the usual size, of Dholera, Hingunghal, Oomrawuttee, Broach, Dhawar, Bengal, and Madras cottons, were exhibited, not for competition, but as an illustration of the mode in which the raw material is prepared and sent to market. From Egypt, and some other minor cotton-growing countries, small samples were furnished, which served to show their progress and capabilities; but nearly all the large commercial bales were from the Southern States of the Union. Some remarkably fine specimens of Sea Island cotton, grown in America, the Fiji Islands, Queensland, and elsewhere, excited much admiration. A quantity of cotton was drawn from the separate bales by expert samplers; and each lot, having a number attached to it, was examined, without the possibility of any one knowing in what district or by what planter it had been grown, in order to secure a perfectly impartial decision. When the names of the successful competitors were disclosed, it was discovered that one of them was a colored planter. This to myself was a source of special gratification, from the fact that I had for many years been engaged, in connection with the Cotton Supply Association of England, in promoting the cultivation of cotton in the colonies and dependencies of Great Britain, and throughout the world, by *free labor*, at the time when the manufacturers of every country were almost entirely dependent upon slavery for the raw material which they required. I may also, perhaps, be permitted to state, that I had the privilege of receiving, during the cotton famine in England, the first cotton (consisting of four bales) grown near Vicksburg by free, colored labor in the then slave-holding States of the Union; and I could not but rejoice to meet the colored planter by the side of his white competitor, in amicable rivalry, and able to establish a claim to pre-eminence in this great branch of American industry.

Class 666. — Hemp, flax, jute, ramie, &c. Both in their primitive forms, and in the stages of preparation for spinning, the assortments were very complete; and the cultivated por-

tions showed that considerable progress had been made in their improvement. This was especially observable in the different kinds of jute exhibited, of which there were several new varieties. The entire collection of these fibres was extremely interesting; and the careful examination of them justifies the conclusion, that they are capable of much further application, and that they are likely to prove of great value and come into extensive use. Whether considered botanically or commercially, they are deserving of attention, and may be made to answer a variety of important practical purposes. The Rhea fibre, or China-grass, known by its Malay name of Ramie, — the *Bachmeria mica* of the botanist, — claims special attention, as likely to become a most valuable material for manufacturing purposes, when the difficulties hitherto experienced in its preparation shall have been overcome. The information and samples obtained from China to aid the investigations of Dr. Falconer enabled him, and afterwards Sir William Hooker, to determine that rhea is the same plant as that from which Chinese-grass cloth is manufactured; and, in the London Exhibition of 1851, several specimens, in various stages of preparation, attracted attention, and gave rise to subsequent experiments for utilizing the fibre. These experiments have served to demonstrate that its inherent qualities entitle it to take a high position amongst fibres, and that it is pre-eminent for its strength and lustre in comparison with others. It has been shown to be considerably stronger than either flax or hemp; and, whilst the fibres are as fine as those of flax, if not finer, it has also the additional advantage of possessing, in a remarkable degree, a silky lustre. Jute, the only other fibre which can compete with it in this respect, is far inferior to it in strength and durability, as well as in its capability for bleaching and dyeing. It has been tried as a substitute for cotton, hemp, flax, wool, and silk. During the scarcity of cotton in England, cottonized rhea was spun, and the yarn woven into different fabrics, and dyed and printed. In some cases, it was mixed with Egyptian, and, in others, with India, cotton. The fabrics acquired a gloss, which gave them the appearance of linen. Though the

experiment was, to a certain extent, successful, the cost and other considerations precluded the possibility of its use as a substitute for cotton. It may, however, become a formidable rival to flax, in the finer varieties. It has also been successfully used as a substitute for longer-stapled wools; and, since the Exhibition of 1851, many attempts have been made, both in England and France, to test its suitability as a substitute for silk, or as an admixture with it; but, in this respect, it has, on account of greater cheapness, a formidable rival in jute. The superiority of rhea to hemp, as regards strength and resistance to water, may make it an advantageous substitute; and it may be possible to replace hempen cordage by lighter rhea ones. Should the prices of the raw material become reduced, and the means of its preparation be improved, rhea can scarcely fail to take a high place amongst fibres, and to come into more extensive use. Indeed, there hardly exists a fibre which, on account of its own inherent properties, can be applied to so many different purposes. It is capable of entering largely into textile manufactures; and, as compared with flax, — which possesses the most extended range of applications, from the roughest canvas and cordage to the finest lace, — rhea has a range even greater still; owing partly to the superlative degree in which it is endowed with the qualities of fineness, strength, and lustre, seldom found in the same perfection in any single fibre, and partly to the singular position which it holds between the usual vegetable and the animal fibres. Although a vegetable fibre, its hairiness assimilates it to wool, and its gloss and fineness to silk. Thus it appears that rhea is capable of as wide a range of applications as hemp, to which it is superior in almost every respect; and, as flax also, with the exception, perhaps, of its use for body linen; whilst it is capable of certain other uses for which only the animal fibres, wool and silk, have hitherto been employed. The cost of the raw material may be said alone to prevent its extensive introduction into manufactures. Any slight technical difficulties experienced in spinning and weaving, which may remain, would speedily be overcome if the price were reduced so as to make its use remunerative. The cultivation of

the rheea plant on a large scale has been encouraged by the British government in India ; and prizes of £5,000 and £2,000 each were offered for the production of machinery to facilitate its preparation for the market, in order to promote its more extensive use for manufacturing purposes. An extended cultivation of this valuable fibre in America will probably be the effect of an increasing demand for its employment in manufactures.

Classes 130, 231, 232.— These classes comprise exhibits which show in a striking manner the wonderful progress made by the cotton industry in the United States, and the remarkable degree of perfection which has already been attained ; but they afford only scanty opportunities for comparison with the manufactures of other countries. The comparatively meagre collections sent by England and other European nations is chiefly attributable to the excessive protective tariffs which still find favor in America, and exclude foreign manufactures from her markets. Those who were thus precluded from the possibilities of trade found but little inducement to incur the trouble and expense of sending their goods to Philadelphia ; and they therefore became conspicuous chiefly by their absence. On this account, it was a subject of great regret, in which almost every European representative shared, that no complete comparison could be made ; and that, consequently, one of the most valuable purposes of an international exhibition was thereby frustrated. Whilst, however, the American textile manufacturers had the field almost entirely to themselves, the small collections supplied by their foreign competitors were sufficient to show that they have nothing to fear whenever they can meet on equal terms, with a fair field and no favor. The general excellence, and, in some cases, the superiority, of the display made by England and her colonies was fully admitted ; and the fabrics sent by the various manufacturing countries of the Continent of Europe were generally distinguished by qualities which placed them upon a par with the best productions of America. Indeed, the praises bestowed upon the few goods exhibited by foreign manufacturers made it a matter of regret that the number

had not been largely increased. Canada made a remarkable display, — one which excited universal admiration, and which, as regards articles of clothing and textile fabrics of all kinds, was fully equal to any in the Exhibition. The American display of textile manufactures was extensive, varied, and important in every respect. The collection of fabrics produced in the numerous mills of the New England States, New York, New Jersey, and other parts of the Union, was as complete as it well could be ; and afforded a striking proof of their capability to compete with the manufacturers of other countries, if it were not for the policy which, to a great extent, excludes them from the general markets of the world. The goods exhibited were, for the most part, pure, even, firm, and well manufactured. The dyed cotton fabrics were pre-eminent for brightness, coloring, and durability. The bleaching, dyeing, and finishing of the various grades and styles of cotton cloth evinced much superiority ; which is probably, in some degree, attributable to the abundance of excellent water which exists throughout the States. The cotton-prints and calicoes, the colored and fancy goods, exhibited both by American manufacturers and their foreign competitors, were so nearly upon an equality that no one could lay claim to any marked degree of superiority. Some bleached shirtings from England attracted attention on account of their special fineness and even texture, combined with softness and purity ; while the collective exhibits from the Gladbach district, Wurtemberg, and Elberfeld, in Germany, were of pre-eminent excellence. The striking effects produced by the Jacquard loom are deserving of high commendation. The beauty of the designs, and the embroidery in handkerchiefs, scarfs, &c., were deservedly much admired. The whole of these classes were conspicuous for exquisite workmanship, elegance of design, and harmonious blending of colors. On the part of every country, much versatility of taste and skill was displayed. There was nothing gaudy, or that could offend the most fastidious or critical observer. The spirited and amicable contest for supremacy, into which all nations have more or less entered in this great Centennial Exhibition,

proves the remarkable progress which has been made in the course of the past century, and affords a powerful stimulus to further enterprise and exertion.

Class 233. — The linen fabrics constituting this class were varied and extensive, and were remarkable for their superior fineness and quality. The Irish manufacturers may justly be said to have taken the lead; those of Scotland were but little behind; whilst Dresden, Wurtemberg, Belgium, the Netherlands, Austria, Italy, Sweden, and Norway, — all presented a very creditable display. The American exhibitors in this class were not numerous, nor did they offer so great a variety as their foreign competitors. These fabrics were of general excellence and utility; and some were remarkable for the superior taste manifested in the coloring. Some of the printed lawns, brocades, and embroidered linens displayed much novelty and elegance of design. The damasks of Dresden and the embroidered linens in the collective exhibit of Wurtemberg are deserving of special mention. If pre-eminence may be claimed by the manufacturers of Ireland, it is only in such a degree as to extinguish envy and excite emulation. All the competing countries in this class are entitled to commendation; and may be congratulated on the progress already made, and the promise thus afforded of still further excellence.

Classes 234, 521, 523, 524. — On these classes, the following statement has been furnished by William W. Hulse, a member of the group: —

“The Chairman of Group 8 has desired me to send a comparative report on the machinery, as an addenda to his own report. But, really, it is not practicable to form a judgment based on comparison, for lack of means; there being in no instance a complete set of textile machinery exhibited from any nation. The only exhibit which approached completeness was in the United States Department; and it was not worked, but kept idle. If I might venture on giving some opinions which I formed, of an abstract character, I would say, that, as regards extent of invention and ingenuity of detail, the United States was far ahead; for there was scarcely an exhibitor who had not some novel features to claim. For consummate invention and arrangement of mechanism, based, — no doubt, on an older experience, — the palm was,

in my judgment, earned for Great Britain. I attributed the extent of ingenuity and invention manifested everywhere in the machinery department of the United States to the fostering, stimulating, and admirable patent-law system. As regards quality of construction, utility, and fitness for the purpose intended, I formed the opinion that the cotton-gin and the calico-printing machinery, and the machinery and tye-in warps from Yorkshire, were the most solid and best examples. The cotton-spool machinery of Conant; the calico-dyeing machinery by Butterworth; spinning and weaving machinery by Draper, Lord, & Company, Kitson, Lyall, Thomas, Crompton, Knowles, and others; and the tentering machinery by Palmer, — all of the United States, — followed very closely upon the best examples from Great Britain. The other class upon which I had to form a judgment, in connection with my co-judges in textile machinery was that of oil-cloths. In this class, I had no hesitation in assigning the first place to the United States, for great variety, beauty of design, richness of colors, and quality of texture, in oil floor-cloths, table-cloths, carriage-cloths, and fancy cloths for upholstery; the best exhibit, in my opinion, being that of Messrs. Potter, Sona, & Co. For design and finish, durability of fabric and colors, and flexibility of oil floor-cloths, of *extraordinary* size and area, the best example in the Exhibition (being fifteen yards long by eight yards wide, in one web) was exhibited by Messrs. Nairne & Company, of Scotland, Great Britain. In other floor-cloths, the Boulinikon, from England, and the American Linoleum floor-cloth, were both excellent in quality, design, colors, durability, and strength, and for warmth to the feet were unsurpassed. It has been my misfortune, in making this report, not to have the assistance at hand of my excellent co-judges, Messrs. Webber and Lockwood, and Professor Hermann, of Germany, on machinery, and Messrs. Waddell and Baker, on floor-cloths, &c. I should be very sorry if my opinion, thus expressed, should in any way differ from theirs; but, so far as I could gather at the time, I am inclined to think it does not."

I may be permitted to say for myself, as I venture to say also for my colleagues, that the duties intrusted to us have been performed conscientiously, and with a deep sense of the responsibility which we had assumed. As representing the countries to which we severally belong, we rejoice in this great Centennial celebration; and, while offering our hearty congratulations, we join cordially in the hope that, as a con-

sequence, the interdependence of all nations may be more fully recognized, and that henceforth the only rivalry amongst them may be that witnessed at Philadelphia, the "city of brotherly love," — an earnest effort to excel each other in the peaceful but glorious achievements of industry, commerce, and art.

I have the honor to be, sir, your faithful and obedient servant,

ISAAC WATTS,

*Judge and Chairman of Group 8,
Centennial Exhibition*

AMERICAN COTTON AND COTTON MANUFACTURES.

GENERAL F. A. WALKER, *Chief of the Bureau of Awards,
Centennial Exhibition at Philadelphia.*

THE report of the honored chairman of Group No. 8 gives a sufficient statement of the details of the results reached by the judges of that group ; but it may, perhaps, be well for the Secretary to make a more general report upon one of the principal subjects of which the judges were called upon to take cognizance, to wit, the cotton and cotton manufacture of the United States.

The general report upon the whole Exhibition, of which this may form a part, will mark a point in the industrial history of this country, and the Exhibition itself may have served as a new point of departure in many branches of industry.

The commanding position of the United States in respect to the production of cotton has long been admitted ; but it seems probable that few even of the manufacturers themselves have been fully aware of the strong position in which the cotton manufacture of the United States now stands in relation to other countries.

The subject of the production of cotton opens so wide a field that it is hard to know where to begin or end. There is no other product which has had so potent an influence upon the history and institutions of the land, and perhaps no other on which its future material welfare may more depend. When the Spaniards first entered Mexico, the natives were found to be clothed in cotton, and the art of weaving and dying had been carried to a high state of perfection for that time, among them. Then, as now, the best and most prolific varieties of the cotton-plant there existed, and the plant is doubtless indigenous in Mexico.

In the United States, a century ago, it was scarcely known as an important production, and not until the invention of

the saw-gin by Eli Whitney, in 1792, did it become so. To-day the United States furnish nearly three-fourths the quantity consumed in their own limits, in Canada, and in Europe combined. There are no data by which the quantity produced and consumed elsewhere can be accurately determined. It may therefore be a matter of interest to state and record, in this Centennial report, the work that we have accomplished, and to forecast the work we may yet have to do.

Among the three fibres — wool, flax, and cotton — which constitute the principal materials for the clothing of the human race, cotton is the most important ; because it is ready for treatment by machinery as soon as it is gathered, because its conversion into cloth is least costly, and because its use for clothing is most conducive to health, in respect to the largest portion of the population of the world.

The rank of nations in importance has heretofore been considered too much in reference to their strength in war. The standard by which this republic should be judged is far different.

The highest rank must soon be awarded to that nation which can serve others with the greatest abundance of the products of its soil, its mines, or its mills, and can take in exchange the largest quantity of the productions of the countries with which it has commerce. Among nations, as between individual men, the exchange of products saves labor to both parties in the transaction, else it cannot exist ; and the highest lesson taught by the Centennial Exhibition has been that, through the interdependence of nations, the law of God will bring, not only peace on earth, but abundance and material welfare, even to those who inhabit the most sterile spots of the earth's surface. Never before has it more fully appeared that the least favored among nations can produce something wanted by the most richly endowed. This is to us the great lesson of the Exhibition.

If we consider our production of cotton in the light of a service rendered, we then find that it stands first in rank among the material services which we render to humanity. In the cotton factories of Europe and the United States there

are a little over sixty-eight million spindles, worked by about one million men, women, and children.

In the operation of these spindles a little more than six million bales of cotton, of the average weight of American bales, are annually converted into ten thousand million yards of cloth, averaging one yard wide and four yards to the pound, or ten pounds to a piece of forty yards, or into the equivalent of such cloth in other fabrics.

This quantity of cloth would furnish five hundred million persons twenty yards each, annually. Of the six million bales of cotton, the United States now furnish about four and a half millions in each year; and our proportion is, year by year, increasing. The eight last crops raised by the labor of freemen exceed the eight last crops raised, before our civil war, mainly by the labor of slaves, in the number of more than fifteen hundred thousand bales. If, then, it be a service to men to provide for them the largest quantity of the material that best serves their need for clothing, in this one respect our rank is assured. Then, let us mark the extent to which we have yet trenched upon our resources. In this production, less than two per cent of the area of the cotton States are yet used. What we may yet accomplish may be better realized by considering the condition of a single State. We will select Texas, as being the State now making the most rapid progress in population, production, and wealth. Few persons can realize the facts in regard to this great State, except by comparison. In area it exceeds the German empire by about sixty thousand square miles. It has the capacity to produce almost all the products of the temperate zone. It is underlaid with coal. But, in respect to cotton, on less than one-half of one per cent of its area, it last year produced one-half of all the cotton consumed in the United States; and four per cent of its area would be capable of producing all the cotton now consumed in Europe and the United States, over six million bales.

Under what conditions is this work now accomplished, or yet to be done? No longer by the forced labor of the slave upon the plantation; but by the labor of freemen, and mostly of freeholders on the farm. In most of the States where it is

now grown, cotton constitutes the salable or money crop of the farmer, who, in other respects, is becoming entirely independent as to his subsistence, raising food and meat to a greater extent than ever before. The Southern farmer still finds in cotton the means wherewith to furnish himself with money for other purchases. Cotton, therefore, being more and more the surplus crop or profit of the farmer, as distinguished from the planter, it becomes more difficult to determine its cost, its annual quantity until each year's crop has been delivered, or the prices at which its production will be checked. In answer to a very extended inquiry lately made by the writer, he has received estimates of the cost of production, ranging from six to fifteen cents per pound; the latter cost, however, having been given by one who, on twelve hundred acres of land, made only four bales of cotton the previous year. The general range of the estimates of cost were six to ten cents. But one answer to the question of cost was the most significant. One said, "I have a nephew, twenty years of age, who, without the least detriment to his schooling, and working Saturdays, produced four bales of cotton." It may be asked, What did this lad's cotton cost to produce?

According to these returns, this Centennial year is also marked by greater improvements than ever before in the selection of seed, in the improvement of tools, in the use of fertilizers, and in the average crop per acre; positive evidence having been given of the production of two thousand five hundred pounds of lint or clean cotton on a single measured acre in Georgia. It was not claimed that this had been, or could be, profitable; but it is significant of the experiments that are being tried in many places. The average estimates of profitable work range from four hundred to one thousand pounds of lint, or clean cotton, per acre, according to the quality of the soil and the kind of work done.

The last ten years have also witnessed the conversion of the seed of the cotton plant into many useful articles but little known before.

The future production of cotton in the United States, and the time within which our staple will take the place of all

inferior grades is, therefore, only a question of numbers and intelligence. In respect to intelligence, it is not to be questioned that the planter of old time had far more skill than many of the farmers of the present time; but the system of labor to which that skill was applied imposed conditions that could not be surmounted, and enforced the use of tools and methods unfit for the purpose. These methods may have assured prosperity to the few at the cost of the many; but it was the high price, and not the low price, of cotton, that limited the extension of the crop. Twenty years since, every bale that could be made by the force then upon the cotton-field was needed; and, under the steadily advancing price, the cost of opening new fields as steadily increased, until, in 1860, it cost fifty per cent more to buy and stock a cotton plantation to raise the cotton for a given factory than it did to build the mill and fill it with machinery. All this has changed; and, in the five years last passed, more than a million persons have migrated to the fertile lands of Texas; and the independent freeholder will only be prevented from making more and more cotton each year by the low price, and not by the high price, it may bring. That no such check is very near may presently be made apparent.

In regard to the exhibit of raw cotton, the exhibition was marked by a collection of commercial bales of every variety of cotton customarily sold in Europe, collected by Messrs. Claghorn, Herring, & Company, of Philadelphia, and said to have been the best collection ever made.

It has been sold to the Dutch authorities, and is to constitute a part of an international exhibition of the products of the soil about to be opened in Amsterdam.

The exhibit of American cotton was limited in quantity, but was of the finest quality. Every bale was of the highest grade; but, as it appeared to be the desire of the contributors that the selection should be a very rigid one, it was made by rejecting one bale after another, until there remained but three; among which the judges could make no discrimination, and for which they made three awards. When the key was opened that disclosed the name and status of the con-

tributors, it was to the equal satisfaction of all the judges, whether from the North or South, or from abroad, that one of the diplomas had been gained by a freedman, — one whose farm, formerly known as the Joe Davis Plantation, in Mississippi, now proves that the production of cotton no longer depends on slavery for its abundance or its quality ; while another was gained by a Vermont farmer who moved to Louisiana since the war ended.

In one respect, great improvement is needed where little has yet been made. The separation of the lint from the seed is the process that should be most fitly accomplished, but which is now most rudely done. The best saw-gin, of the usual construction, unless most carefully attended, tears, breaks, doubles, and otherwise injures the staple ; and but a small proportion of the cotton now made is delivered to the spinner in the best condition. Two new cotton-gins were exhibited at Philadelphia, which promise excellent results, — the roller gin, made by Messrs. Platt Bros. & Co., of England, and the needle-point gin, made by the Messrs. Remington, of Ilion, N. Y. If these machines can be made to produce quantity in ratio to the quality of the staple which they deliver, their wide introduction cannot be long delayed.

The method of packing, covering, and handling cotton in the United States is now unfit in the extreme ; and, as the competition becomes greater with declining prices, it is to be hoped and expected that better methods will be adopted. At present, it is alleged that it is not profitable to attempt better methods ; but the time cannot be far distant when the bale of cotton will be as carefully prepared and protected as the bale of cotton fabrics.

In respect to the supply of cotton fabrics, this country fills as yet but a subordinate position, except as to its own inhabitants. Its relation to other countries will appear from the following table, taken mainly from the annual statement of 1875-76 of Messrs. Ellison & Co., of Liverpool.

SPINDLES PER 1,000 OF POPULATION.	COUNTRIES.	SPINDLES.	COTTON PER SPINDLE.	ESTIMATED AMOUNT OF CON- SUMPTION.
218	United States . . .	9,600,000	68 lbs.	600,000,000
1,180	Great Britain . . .	39,000,000	83½ "	1,297,000,000
135	France	5,000,000	42 "	
108	Germany	4,650,000	55 "	
31	Russia and Poland .	2,500,000	60 "	
675	Switzerland	1,850,000	25 "	
103	Spain	1,750,000	46 "	1,009,000,000
40	Austria	1,580,000	67 "	
148	Belgium	800,000	50 "	
29	Italy	800,000	56 "	
48	Norway & Sweden .	800,000	65 "	
57	Holland	280,000	60 "	
		68,060,000		2,906,000,000

Spindles, 68,060,000 ; pounds, 2,906,000,000 : equal to a little more than six million bales of cotton of the average weight of American bales.

From this table it appears that the United States have a little more than fourteen per cent of the spindles, and consume a little more than twenty per cent of the cotton. About ninety-three per cent of the production of the spindles of the United States is used at home, and about seven per cent is now exported. On the other hand, only fifteen per cent of the production of cotton fabrics of Great Britain is used at home, and eighty-five per cent is exported. As to the other countries named, it is probable that only two — Switzerland and Belgium — produce more cotton fabrics than they consume : the rest import more than they export.

It thus appears that the world is served to a far greater extent by Great Britain than by the United States in the matter of cotton manufactures. Yet, without trenching upon her proportion, the open field is yet vast. If we deduct the consumption of cotton fabrics of the people of the United States, the quantity of cotton consumed by the nations named in the table would furnish four hundred millions of people with twenty yards each of an average fabric thirty-six inches wide and four yards to the pound, or five pounds of the equivalent

of such fabric in other varieties. It should be remembered that the clothing of the nations outside of Europe itself, which are thus supplied with five pounds, or twenty yards per head, mainly consists of cotton. How small this quantity is will appear by comparison with the use of cotton in the United States, where clothing mainly consists of other fabrics. Our consumption is of heavier fabrics, on the average; but, for the purpose of comparison, may be stated at twelve to thirteen pounds per head.

A further analysis will make it very clear that the demand for cotton fabrics may be almost indefinitely extended. For the purpose of this analysis, the case will be stated in round figures, omitting small fractions.

The manufacture of cotton in the United States is equal to a little over thirteen pounds per head of the population, of which a little less than one pound is exported; leaving for home consumption twelve pounds *per capita*.

The cotton manufactures of Great Britain retained for home consumption, according to the annual statement compiled from the tables of the Board of Trade, are equal to only six pounds of cotton per head; but all the goods exported are much more loaded with sizing than those retained for home use. It is probable that a larger proportion of pure cotton is retained than is indicated by the tables.

The consumption of cotton in the countries on the continent of Europe named in the preceding table is equal to about three and a quarter pounds per head, including the population of Russia, or four and one-third pounds per head, excluding Russia. But the Continent of Europe takes from Great Britain one-fourth part of all her exports, — equal to one pound per head additional; making a consumption of about four and a quarter pounds per head, including Russia, or five and a quarter pounds per head, excluding Russia.

The other three-fourths of the exports from Great Britain form, or are substantially equal to, the whole supply of cotton goods, made by European machinery, now consumed in Asia, Africa, South America, Mexico, Central America, and Australia, — continents and countries said to contain from eight hundred to one billion population.

We have seen that the United States consume twelve pounds per head ; Great Britain, six pounds per head, and probably more ; Europe, exclusive of Russia, about five and one-fourth pounds per head : and these countries use cotton only as subsidiary to other fabrics ; while the continents yet remaining to be considered use cotton more than any other fabric. What is their supply ?

The consumption of cotton on the spindles of Great Britain is, in pounds	1,297,000,000
Less for home use	197,000,000
Less export to Continent of Europe, about 300,000,000	497,000,000
Exported to other countries from Great Britain	800,000,000
Exported to other countries from United States	40,000,000

At the rate of five pounds per head, or twenty yards of light sheeting thirty-six inches wide, or fifteen yards of drilling at thirty inches wide, for the full dress of each person, supplied for one year, this quantity of cotton would furnish only one hundred and sixty-eight million people, or only seventeen per cent of the population of the continents and countries named. On the average, the export of cotton fabrics from Europe and the United States to Asia, Africa, South and Central America, Mexico, and Australia, is less than one pound of cotton per head of population. It follows that only one-fifth part of the population of these continents or countries is yet supplied with an average quantity of machine-made cotton fabrics required for a moderate annual consumption.

Cotton fabrics constitute the largest single item of the exports of Great Britain ; and the increase of this export is no longer a question of the first cost of making the cloth. The fabric made upon modern machinery will inevitably displace the hand-spun and hand-woven fabric of Asia and Africa, if it can be placed alongside at a low cost for transportation. In this may we not find one of the lessons yet to be learned by us ? May it not be our policy to promote the carrying of our goods to distant lands, by the repeal of all acts restricting navigation and the exemption of ships from local and national taxation ?

The paramount advantage of Great Britain over the United States in the export of cotton fabrics may not be in the cost of manufacture, in rate of interest, in superior skill, or other advantage affecting the first cost. Our advantage in proximity to the cotton-field of the South, the wheat-field of the West, and the pastures of the South-west, may more than counter-balance any disparity, if any exists, in these respects; but, in her vast merchant marine, unrestricted by statute, exempted from taxation, and promoted only by fair payments for service rendered in carrying mails, and in her thoroughly organized and permanent consular service, Great Britain possesses advantages over us which can never be surmounted except by adopting the same course which has given her this present supremacy.

Leaving to our competitors the share in the supply of the world's need of cotton goods which they have already secured, there yet remain, outside of Europe and the United States, — in Asia, Africa, and South America, — from four to eight hundred million people whose clothing consists mainly of cotton cloth. It must be spun and woven by the slow process of hand-work. Can we obtain our share in this unworked field? Four hundred million persons, at five pounds per head, would require from our Southern States four million additional bales of cotton, and would call for forty millions more cotton spindles in Europe or America to work them up. Who will raise this cotton? and where shall these spindles be constructed?

The empire of China is said to contain about four hundred million people, who are mainly clothed in cotton. The entire export of cotton cloth from England and the United States would supply only twenty-five to thirty millions with five pounds, or twenty yards each, if the whole supply was used for clothing. A large part of the American goods are used for the boat-sails and awnings of the immense river population, and not for clothing.

It thus appears that the cotton fabrics made upon the spindles of Europe and the United States have as yet been substituted for only a small portion of the hand-made goods of Asia and

Africa, and have as yet served but a small proportion of the probable demand of South and Central America, the West Indies, and Australia.

That this demand will vastly increase with the low prices of cotton and the constantly decreasing cost of manufacturing, cannot be doubted. Hence the South has little need to fear the want of a market for all the cotton she can produce for many years to come; nor can it be doubted that the North will contest with England the privilege of serving the increasing need of other nations. It may, therefore, be permitted the Secretary of Group No. 8 to consider from the American stand-point the conditions under which we enter into friendly rivalry with Great Britain in this branch of industry. It is assumed that the principal seat of cotton-spinning in the United States will for many years remain in New England, because her more dense population and the training of the people in the necessary arts assure it.

In respect to cotton, we are nearer the cotton-field, and therefore have an advantage over Great Britain.

In regard to power, our water-power has doubtless been an advantage; but, with the improvements in the use of steam, that advantage may be disappearing. But, in regard to the use of steam, the cost of fuel is steadily advancing in Europe, and declining here. In the food of the operatives, we have the advantage. In the cost of iron, steel, and copper, we are at least even. In leather, lumber, oil, and starch, we have an advantage.

On the whole, our advantages are such that, so far as the rates of wages affect the cost of production, we can afford to pay higher wages, and yet produce cotton cloth at a lower cost. The quality of our goods may not here be treated in comparison with those of other nations; but reference may be had to the report of the Chairman of Group 8, Mr. Isaac Watts, of Manchester, England, upon that point. His report is as follows:—

“The American display of textile manufactures was extensive, varied, and important in every respect. The collection of fabrics produced in the numerous mills of New England, New York, New Jersey, and

other parts of the Union, was as complete as it well could be ; and afforded a striking proof of their capability to compete with the manufactures of other countries, if it were not for the policy which, to a great extent, excludes them from the general markets of the world. The goods exhibited were for the most part pure, even, firm, and well manufactured. The dyed cotton fabrics were pre-eminent for brightness, coloring, and durability. The bleaching, dyeing, and finishing of the various grades and styles of cotton cloth evinced much superiority, which is probably, in some degree, attributable to the abundance of excellent water which exists throughout the States. The cotton prints and calico, the colored and fancy goods, exhibited both by American manufacturers and their foreign competitors, were so nearly upon an equality that no one could lay claim to any marked degree of superiority. Some bleached shirtings from England attracted attention, on account of their special fineness and even texture, combined with softness and purity ; whilst the collective exhibits from the Gladbach district, Wurtemberg, and Elberfeld, in Germany, were of pre-eminent excellence. The striking effects produced by the Jacquard loom are deserving of high commendation. The beauty of the designs, and the embroidery in handkerchiefs, scarfs, &c., were deservedly much admired. The whole of these classes were conspicuous for exquisite workmanship, elegance of design, and harmonious blending of colors. On the part of every country, much versatility of taste and skill was displayed. There was nothing gaudy, or that could offend the most fastidious or critical observer. The spirited and amicable contest for supremacy, into which all nations have more or less entered in this great Centennial Exhibition, proves the remarkable progress which has been made in the course of the past century, and affords a powerful stimulus to further enterprise and exertion."

In only one respect has our principal competitor, England, a great advantage over us ; and that is in her better system of raising the municipal revenues, and in the absence of restrictions upon commerce, — machinery and ships being exempt from taxation.

Thus far we have treated the question in its larger elements. Let us now consider it in its least terms, and witness what marks the progress of the century just ended.

I have assumed a yard-wide fabric, of rather poor quality, as the unit of manufacture. It would not represent the average

quality called for in our own land, but would be a fair example of the average fabric exported from Europe. If made honestly, and not loaded with other substances than cotton, its cost in this country, or in Great Britain, with cotton at its present price of twelve and a half cents a pound would be not far from six cents a square yard; and the margin between the good mill and the poor one, or between one country and another, would not exceed half a cent a square yard. Commerce now depends on the smallest fractions.

Cotton fabrics are gauged by the number of the yarn of which they are made; and the number means the number of skeins of eight hundred and forty yards each contained in one pound avoirdupois.

We may omit all consideration of numbers of yarn coarser than No. 13, or finer than No. 40, as the greater part of the cotton manufacture of Europe and America lies within these limits.

A yard of No. 13 yarn weighs six hundred and forty-one thousandths of a grain; of No. 40, two hundred and eight thousandths of a grain. The question of supremacy in the variety and cost of fabrics between Europe and America, therefore, lies within the limit of less than half a grain on the yard of the yarn, that must first be spun and then woven.

As to the cost, the competition is chiefly confined to plain or twilled fabrics and printed goods. In the cost of manufacture, the competition on coarse goods is within the limit of half a cent a yard, and, on fine goods, within a cent or a cent and a quarter a yard; in printing common calicoes, within the limit of half a cent a yard.

These small fractions represent the maximum of difference in the cost of labor and supplies in a well or ill managed mill, or between this country and Great Britain. It is not intended to admit that there is even so great, or any difference: only that these figures represent the greatest difference ever alleged.

On the other hand, as we have said a part, or the whole even, of the difference in cost of labor and supplies, if it may exist, would be offset by our proximity to the cotton-field.

A marked feature in this branch of industry is in the few persons employed. In the United States, the whole number of operatives in all the cotton factories, bleacheries, and print-works does not exceed one hundred and fifty to two hundred thousand.

Herein lies the progress that marks a century. A hundred years ago, the slow and arduous labor of almost every woman was needed, in order to clothe her family, to be applied to the single spindle, now only seen upon the spinning-wheel that forms one of the curious ornaments of the parlors of those who are fond of old relics. This single spindle gave scanty material for the hand-loom, as slowly operated by some other member of the family, or by a neighbor. Now one woman clothes more than a thousand others, and in many ways lives herself more fitly and comfortably.

It is therefore fit now to record the facts that shall form a part of our Centennial record; that, during the fifteen preceding years, an industrial revolution has occurred in the production of cotton, which, instead of destroying it, as many feared, has firmly established on a righteous foundation and freed it from the taint of oppression which once made it the sign of our disgrace. Its increase amid the turmoil and tribulation of the present time proves that, underlying all that appears upon the surface, economic forces are at work which will control events, and assure peace, good-will, and plenty to all who seek these blessings in truth and soberness. In the manufacture of cotton fabrics, we have surmounted, without grave disasters, chances and changes that would have seemed insurmountable could we have foreseen them, and we have begun the new century upon a firm and solid foundation of hardly earned skill and economy. All that we now need to assure a long era of prosperity is a restoration of the currency to an honest specie standard.

EDW. ATKINSON,

Secretary of Group No. 8.

Boston, Mass., March 1, 1877.

REPORT ON TEXTILE MACHINERY IN GROUP VIII.

BY SAMUEL WEBBER.

It is somewhat difficult to make any report on the textile machinery of the Exhibition, applicable to flax and cotton, which shall attempt any international comparison, from the fact that Great Britain was the only country, except the United States, which made any attempt at an exhibition of such machinery, and her collection was so small and so different in character from the American exhibit that no comparison can be drawn.

Commencing with the British division, the first object of note was the roller-gin, for long-stapled cotton, as modified from the McCarthy patent by Messrs. Platt, of Oldham, and now adapted to the green seed cotton, our common variety, — a very well-built and smoothly-working machine, doing a moderate amount of work, without injury to the staple.

The card, drawing-frame and intermediate roving-frame, of Messrs. Howard & Bullough, of Accrington, contained the only really new principle in this department, in the application of electricity to the "stop motion;" rendering it almost instantaneous, and of great value on the roving-frame, from the fact that "singles," technically so called, caused by the breaking of one of the rovings at the rollers, are almost entirely obviated.

The calico-printing machine and engravers' milling machine, from Gadd, of Manchester, were beautiful specimens of strong, simple workmanship, well adapted to their intended purpose.

The warp-tying machine of Messrs. Greenwood & Batley, of Yorkshire, was very ingenious, but at the same time necessarily complicated; and it remains to be proved whether its economical advantages or practical utility are equal to the ingenuity displayed.

The exhibits of flax and jute machinery, from Messrs. Fairbairn & Co. and Lawson Bros., of Leeds, were fair samples of

staple English machinery ; massive and strong, well adapted to their purpose, but possessing no particular novelty of invention.

The American department was more particularly marked by various novelties than the British, though sadly deficient as a whole in completeness ; there being no complete set of cotton machinery exhibited, although many of the separate machines were there from different makers.

There were several gins for short-staple cotton, exhibited among the agricultural implements, all seeming to be well made, and capable of performing a large amount of work, and doing it well.

The cotton-opener of Kitson, of Lowell, was a departure from the standard practice of late years, in the addition of a spiked cylinder or "rake," to tear open the hard mats of cotton from the bale, before subjecting them to the blows of the beater ; thus rendering the beater more effective in removing the seeds and dirt, and at the same time saving power, and preventing injury to the staple.

The underflat card of Messrs. Foss & Pevey, of Lowell, was another decided novelty, aiming to do the work of double carding on a single machine ; thus saving half the floor-space in the room, and one-third of the power used by the double system. The machine promises well, and is being thoroughly tried, practically, in some of the mills in Lowell and other places.

The system of cotton machinery shown by the Saco Water-Power Machine Shop (unfortunately not in operation) approached more nearly to completeness than any other exhibit of the kind, — containing drawing-frame, slubber, intermediate, and fine roving-frames, and a self-acting mule of the "Parr-Curtis" pattern.

For accuracy of workmanship, proportion of parts, excellence of finish, and practical utility, it left nothing to be desired, and contained also various ingenious improvements. It may be considered, as a whole, the best exhibit of textile machinery from a mechanical point of view.

A set of roving-frames, slubber, intermediate, and fine, was also exhibited, in operation, by the Providence Machine

Company, and fully maintained the reputation of its makers for ease and accuracy of operation, and economy of power at a high speed.

The combined "fly-frame" and "speeder" of Messrs. Mayer & Chatterton, built by Fales, Jenks, & Co., of Pawtucket, was another noticeable exhibit, showing great ingenuity of combination, and possessing the most valuable points of the original machines from which it was derived.

Light and ingenious steel "speeder-flyers" of a new form, possessing great strength, as well as lightness, were exhibited by I. V. Smith, of Manchester, N. H. These have given great satisfaction in mills where they have been tested.

Messrs. Eaton & Ayer, of Nashua, N. H., exhibited a large variety of spools, bobbins, and shuttles, with several ingenious and useful improvements.

Messrs. George Draper & Sons, of Hopedale, Mass., contributed their double-adjustable spinning rings, loom temples, from the Dutcher Temple Company; a ring spinning frame, with the Sawyer spindle; a twister, with a spindle on the same principle; a spooler, with the "Wade" bobbin-holder; and a warper, with a combination of stop-motions. Their rings and temples are well known in the American cotton-mills, — the Messrs. Draper having supplied nearly if not quite all the temples used in the United States for many years; and the Sawyer spindle, which recent trials have shown to be capable of producing more yarn in the same time than the ordinary form of ring-spindle, with a saving in addition of the power consumed, may be safely classed as an invention of great merit and utility.

The Wade bobbin-holder is also coming rapidly into use, and giving entire satisfaction wherever introduced.

The warper is being practically tested in various places. As a whole, the exhibit of the Messrs. Draper shows a great number of novelties of invention.

The Lewiston Machine Shop, of Lewiston, Me., exhibited a warper of excellent construction, thorough finish, and skilful arrangement, which is in use, and highly commended, in a large number of the best mills in the United States.

They also showed several looms of the "Thomas" patent, weaving a variety of fabrics; and a very superior loom making seamless bags. These machines may all be highly commended for adaptability to purpose and excellence of construction.

The looms of Crompton, Knowles, and Wood were all worthy of notice. The original and well-known Crompton loom has been modified and improved from time to time by successive inventions, until it covers a wide range of figured or "fancy-woven" fabrics, and is a thoroughly well built, reliable, and adaptable machine.

The Lyall Positive-Motion Loom is a comparatively new and decidedly valuable invention, of great scope and usefulness, as was shown by the two looms side by side, — one weaving wide-jute canvas for floor oil-cloths; the other, with the application of the Jacquard harness motion, producing eight corsets at once, from as many continuous warps. Besides these, other looms of the same principle were weaving sheetings and seamless bags.

Taken as a whole, this collection was one of the remarkable features of the Exhibition.

Messrs. Butterworth, of Philadelphia, exhibited well-made and ingenious drying machinery, for bleached, dyed, or printed fabrics.

Messrs. Palmer & Kendall, of Middletown, Conn., showed a drying and tentering machine for such fabrics as ginghams, muslins, mosquito-nettings, &c., which require to have the weft threads held firmly and squarely at right angles to the warp while being finished. This machine was very ingenious and well made, and is deserving of notice.

The twine and thread twisting machines, exhibited by Avery, of Worcester, Mass., are also worthy of notice; the invention is an English one.

A very high rank in the scale of mechanical ingenuity must be accorded to the spool-winding and ticketing machines, — both automatic, exhibited by the Willimantic Company. While the original conception of these machines is undoubtedly due to Hezekiah Conant, who does not appear as an exhibitor, the experiments were made and the machines perfected in the shops

and at the expense of the Willimantic Company, who hold the patents, and they were properly exhibited by them. Duplicates of the same machines were shown in the British section, in the exhibit of Messrs. J. & P. Coats; but as it was clearly shown to the judges that the machines were built in America, and had never been out of the country, they were precluded from taking any notice of them, although Mr. Conant, the originator of them, formerly in the employment of the Willimantic Company, is now connected with the Messrs. Coats, in the management of the Conant Thread Company, at Pawtucket, R. I., from which place the machines were sent. The Willimantic Company also exhibited a ring-spinning frame in operation on No. 160 yarn, at a speed of 7,500 revolutions of the spindle per minute. This frame was built by the Lowell Machine Shop, and was filled on one side by spindles of the "Sawyer" patent, and on the other by a spindle which was a combination of the "Sawyer" and the "Pearl." It has not been deemed practicable heretofore to spin such fine numbers on any machine but the mule.

Specimens of their product in all its stages were exhibited; and the excellence of their thread is a sufficient comment on the perfection of their processes and machinery.

Another automatic spool-winding machine, which attracted much interest, was exhibited by the Clark Thread Company of Newark, N. J., but was an English invention, dating back some ten years.

The Messrs. Hope, of Providence, R. I., exhibited pantograph engraving machines for calico-printers, of excellent construction. These machines are well known, and in general use in the print-works in the United States.

This completes the list of the more noticeable machines exhibited. The rapid growth and great extension of the cotton manufacture in the United States, now employing nearly 10,000,000 spindles, combined with the high cost of manual labor, has caused a vast amount of ingenuity to be devoted to the construction of labor-saving machinery; and we regret that a more full exhibit of our cotton machinery had not been made, and one or more complete systems shown in operation.

The same causes, combined with the former high prices of the metals used in construction, to a great extent, have led to the adoption of lighter forms of machines than are generally used in England; and the English judges were at first disposed to find a want of strength in machines which the Americans have found to be amply sufficient for their purpose.

The improvements made in cotton-spinning in the United States were well illustrated by a comparison of the old water-twist frame, built by Samuel Slater, after Arkwright's original model, and exhibited by the Providence Machine Company, with the "Sawyer-spindle" ring frame, shown by the Messrs. Draper, or the Lowell Machine Shop frame of the Willimantic Company.

Signed,

SAMUEL WEBBER.

REPORT ON LINENS.

· THE cultivation and fabrication of flax are among the oldest industries of which we have any record ; and the mummy-cloths of Egypt, and the various references to "fine linen" in the Hebrew Scriptures, bear evidence to the very great antiquity of this manufacture.

As a natural result, nearly all the countries of Europe sent linens, in some form or another, to the Centennial Exhibition ; while, owing to the national interest in and extensive use of cotton, the United States made but a very meagre display, and that partially manufactured from imported flax.

By far the largest and best proportion of the flax fabrics came from Great Britain ; and the collection shown by Messrs. John S. Brown & Sons, of Belfast, Ireland, may be considered, on the whole, as the leading exhibit, — consisting of table linen, diapers, sheetings, shirtings, handkerchiefs, lawns, and yarns, of great fineness and evenness, and of especial beauty of design and skill in weaving in the damask table-linen.

With a less full assortment, but of almost the same class, Messrs. Richardson, Sons, & Owden, of Belfast, presented equally beautiful table damask and fronting linen, and handkerchiefs of great beauty and smoothness, as well as lawns and holland. In quality, there was little choice between the two.

Messrs. Henry Matier & Co., of Belfast, exhibited embroidered handkerchiefs, and cuffs and collars, which were greatly admired for the fineness of the fabric and the exquisite beauty of the embroidery, together with bleached and printed linens.

Robert McBride & Co., of Belfast, showed bleached and printed linen lawns, and linen and cotton fabrics of great excellence. It would occupy too much space to call attention to the merits of every exhibitor in the British department. We can simply say that all were excellent. Messrs. Fenton, Connor, & Co., of Belfast, Dicksons, Ferguson, & Co., and the York Street Flax

Spinning Company, of the same place, and Greenmount Spinning Company, — all made large and superior exhibits.

Messrs. Dunbar, McMasters, & Co., of Gilford, Ireland; Marshall & Co., of Leeds; and Thomas Ainsworth, of Cleator, Cumberland, — exhibited linen threads of well-known quality, among which the linen floss of Messrs. Dunbar, McMasters, & Co., was especially noticeable.

The Scotch manufacturers contributed a different class of goods, — heavy and substantial fabrics, made of linen or jute, or both in combination, and suited to all the ordinary purposes of life; such as table and bed linens, crash, huckabacks, and other towelling; butcher's linen, floor and stair cloths, paddings, shoe-linings, drills, osnaburgs, ducks, buckram, horse-cloths, grain and salt sacks, burlaps, bagging, carpet yarns, &c. And among the exhibitors deserving mention were Messrs. James Normand & Co., of Dysart, Fifeshire; William Laird & Co., of Forfar; the Cox Brothers and Frank Stewart Sandeman, of Dundee. Crossing the British channel to Belgium, we find the exhibit of Jacques de Brandt, of Alost, especially noticeable for the beauty of design and accuracy of execution in damask table-linen. Messrs. Van Damme Brothers, of Roulers, showed indigo-blue linen of excellent quality, for blouses and pantaloons stuffs for the working-classes. Rey (senior), of Brussels, contributed a very large and excellent variety of table and bed and household linen, of medium fineness, but superior quality. William Wilford, of Tamise, exhibited very superior canvas; and the Govaert Brothers, of Alost, also showed good canvas, and bags remarkable for the quality and cheapness.

France was represented, in table linen, by the house of Meunier & Co., of Paris, whose damasks were exquisite in design and workmanship; and in linen thread, by Vrau & Co., of Lille, and Hassebrouck Brothers, of Comines, — both exhibits excellent for strength and evenness of fabric.

Holland sent a variety of substantial fabrics of flax for domestic use, — all serviceable, but none especially noted for fineness or beauty of design. The exhibits of J. Elias, of Strijp, Van Nieuwenhuizen and Van Stratum, of Geldrop; I. H.

Terhorst ; of Ryssen, and L. Planteijdt, of Krommenie, — were all noticed as useful and serviceable fabrics.

Sweden was represented by G. Stenburg's widow, of Jönköping, who exhibited damask table-linen, of good quality and beauty of design.

Germany sent a fine collection in the combined exhibit of the flax manufacturers of Wurtemberg, of great variety and excellent quality ; and Joseph Meyer, of Dresden, displayed damask table-linen, of good design and fine finish.

Austria was admirably represented by the combined exhibit of Messrs. Regenhart and Raymann & Kufferle Brothers, of Vienna, whose damask table-linen, with colored borders, showed surpassing excellence in design, combination of colors, and workmanship in the execution. Carl Siegel, of Vienna, exhibited a variety of staple linen goods, of great evenness and beauty.

Norway sent excellent canvas and twines from the Christiana Sail-cloth Manufactory.

Italy was represented by the table damasks and other fabrics of the Remaggi Brothers, of Navacchio-Pisa.

Portugal sent a number of exhibits of flax fabrics of various kinds : among which I have noted the linen drills of Bahia & Genro, of Oporto ; the bed and table linen of Antonio da Costa Guimaraes, of Guimaraes ; Manuel M. R. Guimaraes, and the National Sail-Cloth Company, of Lisbon.

Spain contributed table damasks of excellent quality, manufactured by Jayme Sado, of Barcelona, hand-spun bed linen, by the Sons of Salvator Landa, Calatayud, Province of Zaragoza ; and a variety of flax fabrics from other exhibitors : also, hemp shoe-thread, of good quality, from Marques, Caralt, & Co., of Barcelona.

Russia, as might be expected, excelled in this branch. Her most noticeable exhibit was that of Messrs. Hillé & Dietrich, of Girardovo, in the Province of Warsaw, consisting of a great variety of fabrics : colored damask table-linen, of superior excellence in design and combination, fringed duck dessert and library cloths, bed and fronting linens, Turkish towels, ducks and drills, &c., — all of excellent and serviceable quality.

Baron Stieglitz, of Narra, exhibited very superior sail-cloth.

James Gribanoff's Sons, of Oostioog, Province of Vologda, showed a very fine display of linen yarns and cloths, table damask, fronting linen, and handkerchiefs, — all of great excellence and beauty.

Lang & Co., of Moscow, had excellent samples of woven hose for fire purposes; and very good yarns and cloths were sent by Alexandroff and Alafus, off of Kazan.

Compared with the foreign contributions, the display from the United States was but small, and is noted as follows: "The Barbour Flax-Spinning Company, of Paterson, N. J., exhibited linen threads, which in strength, color, finish, and evenness compared favorably with the best English threads of Marshall."

The American Linen Thread Company of Mechanicsville, Saratoga County, N. Y., also made a fine display of threads and twines: but the exhibit of woven goods was confined to the crash towellings of the Webster Linen Mills, of Webster, Mass.; and the stair-drills, by the same company, and by the Stark Mills of Manchester, N. H., who also exhibited coarse diaper, with flax warp and cotton filling. All these articles were useful and excellent in their way; but bore no comparison, as evidence of skill and progress, with the linen fabrics of Europe.

We hope that before another centennial the judges may be able to commend American linens as highly as we now can those of Ireland, Austria, and Russia. We have every variety of soil necessary for the growth of flax; and half a century since, before the enormous development of the cotton manufacture, it was a common article of cultivation in many parts of the country, and was spun and woven by hand into domestic fabrics in many households, where the old spinning-wheels are yet preserved as curiosities. Acres of flax are now cultivated for the seed, in many of the States of the Union; but the ripened fibre which is thus obtained is too coarse and harsh for manufacturing purposes. Good flax fibre was, however, shown at the Exhibition, from Canada; and we believe its cultivation for the purpose of

manufacture, and its conversion into yarn and cloth, to be one of the possibilities of the future, and one which will amply repay attention and examination by thoughtful men. It does not seem that the amount of hand labor required to fit the fibre for the machines, now so largely employed for spinning, need be so great as to form an insuperable obstacle.

SAMUEL WEBBER.

REPORT ON FIBRES.

THE best-known and commonly used fibres of vegetable origin, other than cotton, are those of flax and hemp; of which the proportion shown by the United States was very small. Fair specimens were exhibited from West Virginia, Oregon, and Kentucky; but, as was remarked in relation to flax fabrics, the growth of the cotton manufacture seems to have entirely overshadowed this industry. Canada, also, sent two exhibits of flax of fair quality.

Nearly all the exhibits of these fibres of any consequence were from Europe. *Austria* sent flax from Moravia, of excellent quality; and hemp from Hungary. *Italy* contributed the finest specimens of hemp, from Bologna.

Holland showed three (3) very fine collections of flax. *Portugal* was represented by forty-nine exhibitors of flax, and four of hemp; some of the flax short in fibre, but of very fine quality.

Spain had twenty-five exhibitors of flax, and twenty-two of hemp; covering a wide range of length and quality of staple.

Russia contributed thirteen (13) collections of flax, and three (3) of hemp, all of excellent quality; and *Belgium* sent two (2) very fine exhibits of flax, of exceeding fineness and beauty.

A feature of great interest, however, was the display, from various tropical and semi-tropical countries, of fibres little known to us, except by their products; but which seem capable, by the application of suitable machinery, of becoming of immense value in the future, as subjects of manufacture.

The most noticeable of these was the manilla hemp, "*Musa textilis*," from the Philippine Islands, which we usually see in the form of cordage; but which has a fibre capable, like those of flax and hemp, of extreme subdivision, by proper treatment; being composed of a collection of finer fibres, united by a glutinous matter, which is soluble in water, and admits of the

reduction of the apparently coarse, long fibre exhibited (in some cases reaching 12 or 13 feet in length), into a fibre sufficiently fine for delicate fabrics.

Samples of these fabrics were exhibited in the collection from the Philippine Islands, and were well worthy of attention.

In the same collection were also to be found numerous specimens of the "pina" cloth; and the fibres from which they were woven, as well as those of the banana, and other plants of the same genus. The fibres of the agave or yucca, from Mexico, were also very suggestive. Hammocks, nets, "grass-cloth" (so-called), and paper of astonishing strength, were exhibited by the local governments of Yucatan and Hidalgo, manufactured from this material; and its abundance in Mexico and Central America seems to make it a subject worthy the notice of manufacturers, if some ready means can be discovered of cleaning the fibre from the fleshy part of the leaf.

Besides these, there were a vast number of less-known fibres exhibited; the "Phormium," or New Zealand flax, being the most familiar.

All the British colonies sent a greater or less variety of this and other fibres: the "*Fourcroya gigantea*," the ramie, the pita, the plantain, the banana, the pineapple, the wild fig, and the aloe, the silk-grass, and the mahoe, or hibiscus, being among their contributions; forty-nine different varieties, including the above, being contributed from the Mauritius alone, and twenty-six from Queensland. Twenty different varieties were sent by Robert Prestoe, Esq., the government botanist of Trinidad; eight from the Bahamas; and five, from British Guiana.

Brazil, also, contributed several valuable fibres; the *asclepias*, *urenas*, palms (of different species), *bilbergia*, and *fourcroya* being the principal ones.

From Spain came a great variety of samples of the Esparto grass, showing how largely it can be improved in quality by cultivation. This material is at present almost exclusively used for paper-stock, but was shown to be available for a great variety of purposes. Hats, baskets, and other articles were exhibited, which had been made of it; and if, as reported, it

will grow in the sand where nothing else will, it is worthy of attention. The Spanish-Portuguese Indian colonies, China and Japan and Portuguese Africa, also sent a variety of fibres; the ramie or China-grass being exhibited in fabrics in the Chinese and Japanese departments. Mats and matting from reeds, rushes, and other similar plants, were shown by China and Japan, Spain, Portugal, and their colonies; and were deserving of praise for workmanship and ingenuity.

Those of us who can readily recall the whole history of the alpaca manufacture in Great Britain, and the adaptation of existing machinery, with slight modifications, to the purpose, by Sir Titus Salt, and who have also noted the enormous growth of the manufacture of jute in Scotland, in and about Dundee especially, can easily imagine that there is destined to be a great industry developed out of the manufacture of the Manilla hemp, the Sisal-grass, the ramie, and the American aloë; and, with this opinion, we can but think the exhibition of the great variety of fibres at the Centennial as having been of great value in bringing them to the notice of practical men. There seems to be no more difficulty in applying existing machinery to these fibres than to alpaca or jute, if the fibres can be first freed from their woody or fleshy coverings; and that question does not seem to present any insuperable difficulty, though it may require time and patience to develop the most economical method.

SAMUEL WEBBER.

Hon. FRANCIS A. WALKER, *Chief of the Bureau of Awards.*

SIR. — In pursuance of instructions from your Bureau that each group of judges should submit a report exhibiting a survey of the Exposition in their particular department, and embodying the instructive facts observed and conclusions suggested in their examination, the judges of Group IX. have authorized the undersigned to represent the results of their examination. In the consultations upon the awards to exhibitors among the members of this group, who represented ten different nationalities, all national distinctions were ignored; and so full was the interchange of opinion among the judges, and so absolute the harmony of sentiment, that an individual member of the group can hardly fail to express the common opinion. In intrusting the preparation of the general report to an American, there was not only a graceful courtesy on the part of our foreign colleagues, but a recognition of the propriety that the reports of an exhibition made upon American soil, and conducted by American enterprise, should be made from an American standpoint. The latter consideration is enforced by the fact, that the reports of the foreign judges to their own government will state the facts and conclusions specially interesting to the respective foreign nations.

PART I.

WOOL.

CLASS 667. — *Wool in the Fleece, in Bales, and Curded.*

As first in national importance in every country whose civilization has either dawned or matured, wool, the raw material of the oldest of the textile manufactures, necessarily takes precedence. Leading all nations in the supply of this material, the group of British Colonies in the Southern Hemisphere, known as Australia, makes itself splendidly conspicuous. The colonies of New South Wales, Victoria, South Australia, Queensland, Tasmania, Western Australia, and New Zealand, although separate political organizations, exhibit so marked a nationality in this common production that we are compelled to anticipate their inevitable destiny, and consider them as one nation.

Foreign judges, who were familiar with the great European expositions, concur in pronouncing the exhibition of wools by Australia at the International Exposition of 1876 as surpassing any ever before made. The colonies vied with each other in making their exhibits upon a scale proportionate to their vast power of production. Thus, the wools of each exhibitor were shown in bales, in numerous fleeces, and illustrative samples, as produced from ewes, rams, hoggets, and lambs, as

unwashed, cold washed, and hot-water washed, and as adapted for combing or clothing purposes. Of course, the characteristic feature of the display was the capacity of Australia for the culture of wool of the merino race, adapted to the present exigencies of the manufacturing nations; for the exhibition of wool of other races by Australia was comparatively unimportant. The fibre of this race was shown here in the utmost perfection, both in staple and condition, for all ordinary purposes of manufacture, with a production already of gigantic proportions, yet constantly enlarging. When we consider the wide adaptation of this fibre to the uses both of luxury and necessity, and remember that it was for centuries the monopoly of a single nation, refused even to its colonies; that, when Spain relaxed her monopoly, scarcely over a century ago, it was only in favor of the kings of Europe; and that the merinos procured from Spain by George III. in 1792, in exchange for eight carriage horses, were literally the direct source of the Australian wool husbandry, — we must regard the Australian exhibit as one of the most striking illustrations of the world's acquisitions within the last century.

The only deficiency attending this exhibit, and one which the high culture and science of these colonies might have easily supplied, was the want of systematized information as to the statistics of the wool production and sheep husbandry, the methods of improvement, and the details which would be so interesting to the practical shepherd. This deficiency, in some respect supplied by the several commissioners and by personal inquiries and reference to reliable authorities, forbids the fullness of information in this report which the importance of the Australian wool production demands.

The number of sheep, according to the latest returns, is stated in the following communication, addressed to Colonel Sandford, the British Commissioner, and by him forwarded to the writer: —

PHILADELPHIA.

SIR, — In reply to your letter of yesterday's date, covering a communication from Mr. Hayes, I have the honor to inform you, that the number of sheep in the Australian Colonies in the year 1874, the latest year to which I have statistics, was as follows: —

	Sheep.
New South Wales	22,872,882
Victoria	11,225,206
South Australia	6,120,211
Queensland	7,268,946
Tasmania	1,714,168
Western Australia	777,861
New Zealand	11,704,858
Total	61,684,127

The number at the present time would be very much larger; but I regret that I cannot inform Mr. Hayes what is the average rate of yearly increase. The production of wool may be arrived at on the basis of the average clips, which I believe to be 2½ lbs. of *washed* wool for each fleece. If Mr. Hayes consults the export returns of the different colonies, it may be important that he should know that a large quantity of Queensland grown wool is exported from Sydney; and that much of the wool grown in New South Wales is shipped from Victoria and South Australia, owing to exceptional facilities for water and railroad carriage. The statistical returns of the different colonies would, without a knowledge of this fact, be very misleading, by the wool production of Australia being made to appear vastly greater than it is in fact.

I have the honor, &c.,

(Signed)

CHARLES ROBINSON,

Secretary New South Wales Commission.

The report of 1876 of H. Schwartz & Co., of London, very high authority in wool statistics, states the exports of Australian wool in 1875-76, as follows:—

	Bales.
Great Britain	771,786
United States	5,807
Continental countries	2,414
Total	780,007

This amount, according to their estimate, is equal to 247,700,000 lbs.

The report for 1874 of Mr. Alexander Bruce, the chief inspector of live-stock in New South Wales, declared to be a high authority, gives the following instructive facts in relation to the sheep of that colony, and may be regarded as illustrative of all the colonies:—

SHEEP (A).

1. *The Number.* — The number of sheep in the colony in 1874 was 20,709,338, and 22,767,416 in 1875; being an increase in 1875 of 2,058,078.

2. *Combing and Clothing.* — The returns give 6,100,000 combing sheep, and 5,490,000 clothing; while, with respect to 6,420,000, it is not stated whether they are combing or clothing, and, in a good many cases, owners give no information.

3. *Long-woolled and Cross-bred Sheep.* — Of these, some 125,000 are returned; and they are given as being of the following breeds: Leicesters, 15,881; Lincolns, 9,771; Downs and other breeds, 37,583; and Cross-bred sheep, 62,242.

4. *How kept.* — In 395 cases, sheep are returned as depastured in paddocks; in 504, as shepherded; in 88, as both in paddocks and shepherded; and, in 381 cases, no information is given on this point.

5. *Improvement.* — On 681 holdings, the sheep are reported to be improving; on 43, as deteriorating; on 72, as stationary; and 548 owners make no returns.

6. *Stud Sheep introduced.* — The returns show that of these sheep there were 23,412 introduced, of which, 18,086 were merino, 343 Leicesters, 4,741 Lincolns, and 42 Downs.

THE ADVANTAGES OF FENCING FOR SHEEP.

1. *Improvement.* — (1) In the health and soundness of the sheep; (2) in their size and stamina; (3) in the quantity and quality of wool; (4) in the carrying capability of the holding.

2. *Saving.* — (1) In expense of management; (2) in the losses arising from shepherding, especially from bad shepherds.

3. *Advantages to Owner.* — It relieves him from the trouble of managing shepherds and hut-keepers, and allows him time to attend to the improvement of the breed of his sheep.

4. *General Benefit.* — This is stated by owners to be an increase of the value of a run of from 20 to 60 per cent.

SHEEP (B).

I. LAMBING.

The general average of shepherded flocks was 72½ per cent; of paddocked sheep, 75 per cent; and of sheep depastured both ways, 74½ per cent.

II. CLIP.

1. *Greasy.*—

	lbs.	oz.
The average clip of greasy wool in shepherded sheep was	4	3 $\frac{1}{8}$
„ „ paddocked sheep was	4	15 $\frac{3}{8}$
„ „ both	4	10 $\frac{7}{8}$

2. *Creek-washed.*—

The average of shepherded sheep was	2	12 $\frac{1}{8}$
„ paddocked	3	4 $\frac{3}{8}$
„ both	2	12 $\frac{1}{8}$

3. *Hot-water washed.*—

The average of shepherded sheep was	2	8 $\frac{3}{8}$
„ paddocked	3	2
„ both	2	11 $\frac{1}{8}$

4. *Scoured.*—

The average of shepherded sheep was	2	2 $\frac{3}{8}$
„ paddocked	2	8
„ both	2	10

III. DIFFERENCE IN WEIGHT BETWEEN COMBING AND CLOTHING.

On this point, 1,238 owners give no information; 75 cannot say; 4, that there is no difference; 32, that there is a slight difference in favor of combing; 4 put the difference at 8 oz.; 2, at 12 oz.; 1, at 16 oz.; 4, at more than 16 oz.; and 6 state that combing is the more profitable.

The important facts presented by this statement, are that more than half the sheep produce combing wool; the respective weights of the greasy, creek-washed, hot-water washed, and scoured wools; and the positive testimony, which should be specially noted by the California wool-growers, as to the advantages of fencing sheep. It is obvious that this must depend somewhat upon the nature of the feed and general custom of the country, and still more upon whether the flock-masters own the land, or pasture at large. In this connection, it may be noted that Mr. Bruce elsewhere states that the fence most approved for sheep and cattle is a fence with split posts, — one split-top rail and five wires.

The following communication from the commissioner of another colony — South Australia — gives the following interest-

ing and illustrative facts as to the weight of fleeces and the extent of the flocks of individual flock-masters :—

SOUTH AUSTRALIAN WOOL.

MAIN BUILDING, 8th June, 1876.

To the Judges of Wool, Philadelphia Centennial Exhibition.

GENTLEMEN,—As Commissioner for “South Australia,” I have the honor to subjoin a statement of the weight of fleeces of wool examined by you in this court. Taking first a copy of the *declared weights* of some wool in bales seen by you, and of which you have the growers’ names, and then appending the weights of fleeces you desired should be weighed in the Main Building :—

I. — Declared Weights of Wool Exhibited, all unwashed.

A. — MOORAK WOOL. (W. T. Brown.)

No. of Bales and Class of Sheep.	Contents in Fleeces.	Average Weight of Fleeces.			Age of Sheep.
		lbs.	oz.	dwt.	
No. 1. Ewes	14	7	9	2 $\frac{1}{4}$	3 years.
„ 2. Hoggets	15	7	3	3 $\frac{1}{8}$	18 months.
„ 3. Lambs	20	2	12	12 $\frac{1}{8}$	4 „
„ 4. Wethers	15	7	6	6 $\frac{1}{8}$	2 years.
Mem. 40,000 sheep are pastured at “Moorak.”					

B. — WONOKA WOOL. (Hayward, Armstrong, & Co.)

No. of Bales and Class of Sheep.	Contents in Fleeces.	Average Weight of Fleeces.			Age of Sheep.
		lbs.	oz.	dwt.	
No. 1. Ewes	14	7	1	2 $\frac{1}{4}$	3 years.
„ 2. Hoggets	13	7	4	14 $\frac{1}{8}$	18 months.
„ 3. Lambs	20	3	11	3 $\frac{3}{8}$	5 „
„ 4. Wethers	12	8	0	0	3 years.
Mem. 23,759 sheep on “Wonoka.”					

C. — WILPENA WOOL. (Price & Browne.)

No. of Bales and Class of Sheep.	Contents in Fleeces.	Average Weight of Fleeces.			Age of Sheep.
		lbs.	oz.	dwt.	
No. 1. Ewes	11	7	0	0	3 years.
„ 2. Hoggets	12	7	5	5 $\frac{1}{8}$	18 months.
„ 3. Wethers	10	8	11	3 $\frac{3}{8}$	3 years.
„ 4. Lambs	16	3	7	0	5 months.
Mem. 62,648 sheep on “Wilpena.”					

D. — KEYNES.

1 Bale Wethers . . . 15 fleeces; average weight 9 lbs.; 4 tooth sheep.

Mem. 13,000 sheep kept by Mr. Keynes.

E. — Allan McFarlane. (N.F.) Wool.

1 Bale Ewe with lamb . . 15 fleeces; av. weight 6 lbs.; well sorted; 3 yrs.

Mem. 15,500 sheep kept by Mr. McFarlane.

F. — COLLINGROVE. (J. H. Angus.)

No of Bales and Class of Sheep.		Contents in Fleeces.	Average Weight of Fleece.			Age of Sheep.
			lbs.	oz.	dwt.	
No. 1.	Ewes	not stated	6	1	0	2 toots.
„ 2.	Hoggets	25	7	10½	0	2 and 4 toots.
„ 3.	Wet Ewes	not given	not given			4 and 5 toots.
„ 4.	Lambs	„	„			not given.
„ 5.	Lambs	„	„			„
Mem. 100,000 sheep on “Collingrove.”						

II. — Weights of Fleeces weighed in the Building as requested.

First. — Of the four fleeces exhibited by J. KEYNES. (*Merino Wool.*)

Fleece	lbs.	oz.	dwt.
Fleece 1 weighs	11	6	0
„ 2 „	10	12	0
„ 3 „	10	11	8
„ 4 „	12	7	8

Second. — Of the fleeces exhibited by J. MURRAY. (*Merino Wool.*)

No.	lbs.	oz.	dwt.
No. 1 weighs	12	11	8
„ 2 „	12	2	8
„ 3 „	15	11	0
„ 4 „	14	5	0
„ 5 „	15	13	0
„ 6 „	15	3	8

Third. — Of the fleeces exhibited by THOMAS GRAHAM. { *Mixed Lincoln and Leicester.*

No.	lbs.	oz.	dwt.
No. 1 weighs	13	11	6
„ 2 „	11	6	12
„ 3 „	11	15	0
„ 4 „	12	9	8
„ 5 „	10	2	0
„ 6 „	13	3	0

I have the honor to be, gentlemen,

Your obedient servant,

SAM. DAVENPORT,

Special Commissioner for South Australia.

A brief review of the methods by which the Australian sheep husbandry has reached its present commanding position, with a

presentation of some of the instructive facts in relation to the merino culture drawn from Australian experience, is justified by the importance of the subject. The principal sources of this review are responses to personal inquiries, or authorities obtained from or confirmed by the respective colonial commissioners. Of the works having this sanction, the most important are Mr. Graham's treatise on the "Australian Merino," and the "New South Wales Wool Inquiry," published in 1871 by the Agricultural Society of New South Wales.

Captain John McArthur, an officer of the British army, who had landed at Sydney in 1790, just two years after it had been formed into a penal settlement, was the first to observe that the fleeces of the hairy Bengal sheep, brought from the Cape of Good Hope, had in some way become sensibly ameliorated. Conceiving the idea that the soil and climate of the settlement were peculiarly adapted for the production of fleeces of the best quality, he induced the importation of a small flock of merino sheep which had been sent to the Cape of Good Hope by the Dutch government. In 1803, he took with him to England samples of wool from the crosses which he had made of coarse-woolled ewes with Spanish rams. At that period all the fine cloths of England were made of wool imported from Spain. Fortunately, Captain McArthur arrived in England at a time when the English manufacturers were alarmed lest their wool supply from Spain should be cut off by a threatened war. Through the influence of these manufacturers, Captain McArthur secured the assent of the British Secretary of State for the colonies to his application for a grant of ten thousand acres of land in New South Wales, for prosecuting the growth of fine wool for export. He also obtained a few Spanish merinos from the royal flock of George III., these merinos being the "twin Cabana with the French Imperial Cabana, Rambouillet." Having arrived in the colony with his chosen flock, which was placed upon the tract of land secured by his grant, he commenced the reclamation of his estate and the creation of fine-wool flocks, through the persistent use of the George III. rams upon so sorry a lot of sheep that "long years were taken to eliminate

the bad qualities of the pristine animals on which he bred." For years, the only efforts for improvement were made by himself; and so slow was his progress, "that it took some twenty-three years" to perfect the pure breed of Australian merinos. In 1810, the exportation was only 167 lbs.; in 1820, 99,415 lbs.; in 1826, 806,302 lbs. The best growers in the colony "bred from McArthur's ewes." "From about 1829 to 1840," says Mr. Graham, "the Australian wool had a character so uniform and fixed, that an English wool broker or sorter could with certainty select by the touch alone, from a bale of others, a Botany Bay fleece, as they were called." The sheep, however, were small, — the ewes weighing not more than 30 to 34 lbs. each, — and the wool wanting in denseness; the animals being bred mainly for fineness, in which they excelled. Smallness of size still appears to be the general character of Australian sheep, as shown by the average yield of unwashed wool per sheep in New South Wales, — 4 lbs. 9 oz. After the time of Mr. McArthur, who died in 1834, many breeders, by selecting the largest and best-woolled sheep to breed from every year, and by keeping their runs understocked, or by liberal feeding, imparted size and density of fleece to the Australian merinos, the ewes of some flocks attaining an average weight of 70 lbs.

Subsequently to 1835, stud sheep were largely imported from abroad; attempts were made to improve the Australian merinos by crosses of the English races, — the Leicesters, Lincolns, and Downs, — not only with signal failure, but with incalculable injury to the most of the native merinos.

The Rambouillet sheep were also largely introduced; also without benefit, in the opinion of Mr. Graham, because without artificial sustenance they were too large for the country. The German sheep, imported at great expense, produced no benefit either in quality of wool or weight of fleece. Recently, Vermont sheep have been introduced; and Mr. Graham says, "Of all imported sheep, those of our first cousins, the Americans, are the best."

The results of Australian experience would seem to show that climate has less to do with the excellence of merino wools than

is commonly supposed. The "salt bush" country (a region of excessive heat) "can and does, in some instances, produce as heavy or valuable wool as do any other portions of the colonies; and wool of the Darling Downs, within the tropics, grown by a careful and judicious system of selection, is unexceptional, although known as a "hot-country wool." Still, Australia confirms the theory of scientific writers, that the natural region for merino sheep is the region of the *vine*; for the excellent wines of these colonies were among the most characteristic of their productions shown at the Exposition.

Another lesson taught by the Australian sheep husbandry, confirmed by notes taken at the Exposition, is the advantage of close breeding. Mr. Graham says that, for a period of twenty-five years, he was engaged in testing the value of in-and-in breeding. By in-breeding he does not mean indiscriminate breeding, without selection: but, on the contrary, breeding with judicious selection; that is, rejecting the faulty sheep, male and female, and breeding only from the perfect. With this qualification, he remarks: "I say that I never saw an entire flock of really good sheep that was not wholly composed of in-bred animals; and I think it scarcely possible to breed good sheep without having recourse to in-breeding."

It was interesting to observe that these views were confirmed by memoranda attached to Australian fleeces displayed at the Exposition, — memoranda made, of course, without reference to any theory of breeding. Some of these memoranda were as follows: —

"Gere & Co., Yandella, Queensland. Combing ewe, bred pure within their own flocks for twenty-one years, bred in paddocks, entirely on indigenous grasses."

"C. B. Fisher, East Haddington Hill, Darling Downs District, Queensland. This clip has been bred in Adelaide, South Australia, for forty years *in and in* to their own blood, and have been acclimated in Queensland seven years; pronounced by chamber of commerce to be the most essentially combing wool."

"George Clark, Queensland. Sheep improved by Tasmanian merinos, bred pure for more than fifty years."

"C. H. Grison, Queensland. Bred within their own blood many years."

Undoubtedly, one object of this close breeding with large flock-masters is to preserve the special characteristics of the wool approved by their old countries. It is well known that so uniform are the characteristics in certain flocks, and so high the probity of the growers, that the clips of some proprietors are purchased by the same customers from year to year, almost without testing. This uniformity and reliability is one of the great advantages to the manufacturer of having sheep husbandry pursued on a large scale. He may select from one or two clips, with certainty, the precise wools adapted to his fabrics. This advantage has already been perceived in purchases from our California; where wool growing, conducted by capitalists in large flocks, has begun to be pursued, as in Australia, systematically and scientifically.

Sheep husbandry, being — not even excepting the gold mining interests — of the first importance in the Australian Colonies, is pursued by capitalists and men of intelligence. Relieved, as the proprietors are, from the principal expense in Northern climates, — that of providing shelter and stores of winter fodder, — winter protection not being required, and the indigenous grasses being nutritious even when dried, the principal outlay required, in addition to that for stock, is for providing an uninterrupted supply of water. The destructive droughts of 1866 have led to provisions for this supply on the broadest scale. Precautionary measures have been taken, over the length and breadth of Australia, against the failure of water. At enormous expense, dry water-courses have been converted into permanent rivers, reservoirs and tanks have been constructed, wells have been dug and dams made, and the stations so provided with water as to prevent the recurrence of the catastrophe of 1866.

The expense of transportation to the very distant markets making the weight of the dirt and yolk of the wool a serious item, the washing of the wool on the sheep is conducted with a thoroughness nowhere else known. The washed wools, whether cold or hot water washed, extensively exhibited at the Expo-

sition in bales and cases, could scarcely be distinguished from scoured or absolutely clean wools.

Attention is given to every detail connected with the manufacture of wool, — as in the shearing. The uniformity of the clipping in fleeces exhibited at the Exposition, the steps usually made by the shears being scarcely visible, was the subject of favorable comment by our wool-growers ; yet the price paid the shearers, reported in the official record of Victoria, is only 14s. 4d. for every hundred sheep shorn.

The "Wool Inquiry" instituted by the Agricultural Society of New South Wales is illustrative of the high intelligence with which the wool industry of the Australian Colonies is pursued. The main subject of the inquiry was, What descriptions of wool are now and likely to be most in demand ; and what are the best modes of preparing the wool, and putting it in the market ? Circulars containing interrogations, all pertinent to this general question, were addressed to the most eminent wool houses and chambers of commerce of England. Full answers to these interrogations, by the thoroughly informed persons and commercial bodies in England, are published in the "Wool Inquiry." As the readers of this report will be principally those interested in wool production, we may be permitted to condense some of the most important points presented in these answers.

1. As to the distinction between combing and clothing Australian wools, says one of the respondents, — Southey, Baline, & Co., —

"All wools of Australian production can be used for clothing, but by no means all for combing. There are limits as regards length of staple, in the first place ; and other requisites, such as soundness and elasticity, necessary for the latter purpose. It will be clear, therefore, that within these conditions no line of distinction can be drawn, above or below which it can be said that this or that sample is a clothing wool and a clothing wool only, or a combing wool and a combing wool only."

The committee, in their interrogatories, proposed for combing wool the following points of excellence, or questions, which

should distinguish a true combing wool: viz., 1, weight; 2, color or lustre; 3, length; 4, freeness; 5, fineness; 6, elasticity; 7, softness; 8, soundness; 9, evenness of fleece; and they requested their respondents to divide a thousand points among them according to their respective values.

J. T. Simes & Co. reply, —

“Soundness is the first requisite in combing descriptions; next, length, up to three and a half inches for fine merino. This *desideratum* is a most essential one in combing descriptions. We should place the characteristics of a merino combing wool in the following order and value: soundness, 300; length, 250; freeness, 175; weight, 100 (important to growers); evenness, 75; elasticity, 50; fineness, 50. Lustrous color is scarcely an element in merino combing.”

H. Schwartz, —

“Soundness and quality, not singly but combined, constitute the most valuable feature of a combing, small growth and softness, that of a clothing, wool.”

Hazard & Caldicott give the following tabulation of the relative importance of qualities in combing wools: —

	Length.	Density.	Softness.	Fineness.	Elasticity.	Evenness of Fleece.	Soundness.	Weight.	Total pounds.
Combing . . .	170	60	80	50	90	80	170	150	1000

A similar question was proposed by the Agricultural Society in relation to the desirable qualities of *clothing* wools.

To this Jacomb, Son, & Co. reply: —

“The chief requisites of a good *clothing* wool are fineness, density, softness, and felting qualifications.”

H. Schwartz, —

“Small growth, softness, &c., combined, constitute the most valuable features of a clothing wool.”

J. T. Simes & Co., —

“Clothing wool may be estimated by the following points: fineness, 300; softness, 200; density, 150; evenness, 100; elasticity, 100; weight, 100; soundness, 50.”

Hazard & Caldicott give the following table: —

	Length.	Density.	Softness.	Elasticity.	Evenness of Fibre.	Soundness.	Condition.	Weight.	Total pounds.
Clothing . . .	50	140	80	170	80	80	140	150	1000

As to the question, whether combing or clothing wools are likely to be in most demand, the answers are, substantially, that the greater demand at present for combing wools is due in some measure to the fashion for worsted coatings; but that no man can with certainty forecast the future. As to prices, it is said there is a difference of opinion; but the preponderance is that the *best* clothing wools bring the best prices, although they have less weight. As to shearing and shipping in grease, it is answered, that this is almost wholly dependent upon local circumstances; such as the washing facilities at the station, though the washed condition is that most generally acceptable to various buyers and consumers. For uses in which color is an important quality, the unwashed wools stand at a disadvantage, as there is “a greater difficulty in procuring a bright color from wools which have been packed and shipped in the grease.” The Bradford Chamber of Commerce decidedly recommends washing as “peculiarly most advantageous to the grower.”

As to cold or hot water washing, the preponderance of opinion appears to be that there is very little to choose between the two processes, where both are efficiently and skilfully applied.

In reply to the question, What proportion of yolk should be retained in the wool? all agree that just sufficient yolk should

be retained to give a "kindly handle" to the fleece, the amount being variously put at from ten to twenty per cent. Webster, Dewall, & Co., say, —

"The sheep should be allowed forty-eight hours minimum run between washing and shearing, but in cold weather more time might be required. No yolk should be retained; but it should be allowed to rise again after washing, to the extent of twenty per cent. After washing, the fleece should be allowed to dry thoroughly on the sheep's back; and only sufficient yolk should be allowed to rise to give the wool a soft and silky feel. In fact the aim under all circumstances, whatever process of washing may be adopted, ought to be to give this soft silky handle. The slight quantity of yolk tends to preserve the wool, and cause it to retain its natural elasticity and strength."

In answer to the question as to sorting and skirting and packing, the respondents recommend that fleeces should be carefully skirted, and stripped of all locks, bellies, and stained, burry, or seedy pieces; great care being taken that shanks or kempy hairs are not folded in the fleece. The pieces should include the pole lock, belly piece, skirting, and shank, and any portions towards the extremities which are either stained, or badly infested with burr or seed, and by the removal of which the rest of the fleece will remain comparatively free from faults. In respect to the classing of wools, Mr. Schwartze says, —

"With very superior brands, elaborate sorting is desirable. In the case of medium and good wools, the separation into young wool, first and second combing, first and second clothing, cross-bred lambs, pieces, and locks, is all that is required; while, with superior and faulty wools, plentiful skirting is sufficient.

"This long abstract of the 'Wool Inquiry' will be excused, as it serves to answer questions directly presented to the observer by the peculiarities of the Australian wool exhibits; while the whole review of Australian wool industry anticipates many points which would arise in considering the merino wool culture of other countries."

It is a natural inquiry, whether the Australian wools will continue to increase at the accelerating rates which have been witnessed in recent years. In the last decade, the increase in New South Wales has been threefold; the numbers of sheep in

1866 being 8,132,511, while the returns for the year 1875 reached nearly 25,000,000. The commissioners of this colony declare, in their official catalogue, that if seasons continue propitious, and prices are maintained at any thing like the present rates, the probability is very great that another ten years will see New South Wales doubling the number of her sheep, and able to exhibit a return of forty or fifty millions.

ARGENTINE REPUBLIC.

The country ranking second in importance in the supply of the wools of commerce is the Argentine Republic. The number of sheep, as stated by Mr. Olldendorff, the Chief Commissioner of this republic at the Exposition, from a numeration made by himself as Commissioner of her Agricultural Department, is 57,501,260, with an annual yield of 216,000,000 lbs. of wool; all of which, as there are only one or two wool manufacturers, may be said to be destined for export. The details as to the numbers and distribution in the several provinces of this republic, as furnished by Dr. Olldendorff, are as follows:—

Number of Sheep in Argentine Republic, by Census of 1876, given by E. Olldendorff.

		Value.
Buenos Ayres	45,511,858	\$72,818,172
Entre Rios	3,000,000	3,600,000
Santiago	1,200,000	960,000
Santa Fé	4,500,000	3,600,000
Corrientes	77,846*	878,000
Córdoba	1,405,688	1,060,000
San-Luis	118,815	170,000
Catamarca	114,420	145,000
Rioja	53,982	108,000
Fucuman	70,000	56,000
Mendoza	58,856	94,500
San-Juan	120,200	285,000
Jujuy	514,621	381,473
Salta	64,980	46,000
Total	57,800,616	\$84,152,146

* This probably should have been 770,846, as indicated by the value.

Extract from Letter of Dr. E. Ollendorff to George W. Bond.

"The number of sheep and value I give you are official, and are as near the truth as any man ever got it, except the misprints in Corrientes; where it must be 77,846 sheep, value \$87,800."

"216,000,000 lbs. of wool is too much for 57,501,260 sheep. You cannot calculate more than an average of $3\frac{1}{2}$ lbs. per head, which would give you 201,254,410 lbs. of wool."

"There is no province in the Argentine Republic called Pena. I know a district in the Province of Cordova called Las Peñas, where a good many sheep are; but the principal wool growing is in the Province of Cordova, the Valle de la Punilla. The name is derived as follows: Puna is a class of grass very hard, without any value; Punilla is a grass similar to the Puna grass, but soft and pretty good. *Illa* and *ita*, or *iza*, means small, tender; and so Valle de la Punilla means the valley where the Punilla grass grows."

The chief, though not to our own country the most important, portion of these exports consists of merino wools. The exhibits of wools from this country, with the exception of that of Mr. Samuel B. Hale at the Exposition, scarcely did justice to the importance of this production. The most noticeable feature was the enormous size of some of the fleeces of merino wool of the Rambouillet and Negretti stock: one fleece, a pure-bred Negretti ram, grown in eleven months and eighteen days, weighing thirty-one pounds; other Rambouillet fleeces weighed twenty-five and twenty-seven pounds. Two pelts were shown from sheep of the same race; one of which measured five feet six inches in length, and four feet in width at the hips, with a staple nine inches in length. These fleeces, although they may illustrate the recent attempts for improvement, do not illustrate the general character of the merino wool of this country. The general characteristic of these wools is lightness of fleece, the weight not usually much exceeding three pounds in the grease to the fleece. They are fine, soft, and short, and principally suited for the card, though generally wanting in strength and nerve. Their principal defect, however, is the *carratilla*, or burr, clinging to the fleece, derived from the clover or white medoc on which these sheep feed, which

seems to be inseparably connected with the productive lands and best pasturage. Notwithstanding these defects, — which are obviated by burring machinery, and more recently by chemical processes applied either to the wool or to the cloth, — these wools are in high esteem with the cloth manufacturers, especially of Belgium and France.

The Argentine Republic vies with Australia in representing the results of the merino wool culture in the last century. The raising of fine sheep was not seriously commenced until 1826, when it began with the importation of good merino animals, with German shepherds, under the direction of Messrs. Hannah and Sheridan, whose establishment still survives. When fairly commenced, the production increased with an accelerating ratio. The exports rose from 944 bales, in 1832, to 3577, in 1840, — an increase of 280 per cent in eight years. In 1850 it attained 17,069 bales, — an increase in ten years of 380 per cent.

This country, with a climate where the cold of winter is so moderate as to exhibit no more severe effects than slight hoar frosts which disappear with the morning's sun, with an extensive seaboard, and internal an arterial system of rivers counted among the finest in the world, and with a soil furnished by a rich and vast alluvial plain, on a subsoil of silicious clay, would seem to have a capacity for an unlimited wool production of merino wool. It would be well if the same could be said of another branch of wool, the product of this country, — that proceeding from the indigenous races, or rather the descendants of the coarse Spanish sheep introduced by the conquerors in the middle of the sixteenth century. These wools, proceeding from Churros sheep of Spain which have not been crossed with the merinos, proceed from flocks found in the Sierra de Cordova, at an altitude of from three thousand to five thousand feet; also, from other provinces of the Argentine Republic, as shown at the Exposition, each known by the name of its province. The wool, long though coarse, and produced in small fleeces, is in great demand in this country for the manufacture of carpets. A plateau in the Province

of Cordova, of eight hundred superficial leagues in extent, at an elevation of above ten thousand feet, produces sheep of this race which bear much larger fleeces of long carpet wools. Some of the pelts were shown at the Exposition. The tendency is for these wools to constantly increase relatively in value, as they are grown only by the rudest people, who are diminishing rather than increasing in numbers. The question of the future supply of these wools is, therefore, one of serious consideration with carpet manufacturers.

Three specimens of fleeces styled *Lana de Lina* were also shown. These are the wool of the cross of the sheep and the goat. They resemble the wools of the sheep of the several provinces where they were grown, in appearance; but are more wiry and slippery. Mr. Olldendorff, who is a man of thorough scientific and practical information upon all subjects connected with agriculture, and has resided in Buenos Ayres for twenty years, being now the head of the agricultural department of the Argentine Republic, says that they are the offspring of the he-goat and the ewe, — never of the ram and the she-goat, — and invariably sterile. The skins dressed are called *pellones*, and used by the natives to cover their saddles. In travelling over the mountains, frequently eight or nine are put upon the saddle, on top of which the rider mounts. They serve for his bed and covering as he bivouacs at night.

CAPE OF GOOD HOPE.

The third great source in the Southern Hemisphere of fine wools of commerce is the colony of the Cape of Good Hope. The statistics, as furnished by Mr. Coates, the commissioner of the colony, are as follows: —

Number of woolled sheep in 1875	10,064,289
Other sheep	944,060
Angora goats	972,983
Export of wool in 1874, 48,000,000 lbs.	

H. Schwartze & Co.'s report, Jan. 18, 1877, gives the following statistics in relation to the Cape of Good Hope: —

IMPORTS.	1876.	1875.	1876.	1875.
	Bales.	Bales.	Lbs.	Lbs.
England	169,908	174,598	42,064,712	44,190,960
Continent	1,033	997		
America	7,529	14,001		
Total	178,470	189,596		50,600,000

The imports into England are chiefly washed. They estimate the number of sheep at 16,000,000.

OTHER SOUTH AMERICAN COUNTRIES.

Chili. — No facts as to the wool production of this country could be obtained at the Exhibition. Statistical reports from this country give the exports of wool for 1872 as 5,773,821 lbs., for 1873, as 4,102,078 lbs., and estimate the whole clip of the country at 3,000,000 kilogrammes, or 6,600,000 lbs.

Uruguay. — An official report of the export of Monte Video (Uruguay) makes the whole exports of wool 51,953,854 lbs.; imports from Argentine Republic to be deducted, 7,188,425 lbs.; total, 44,768,829 lbs.

Another statement gives the export as 57,042 bales, which, at 900 lbs. per bale, — the usual size for that country, — would be equal to 51,637,800 lbs.; from which are to be deducted 7,188,425 lbs. imported from the Argentine Republic.

Peru and Bolivar. — There are no sufficient data in relation to this country. The best estimates give the amount of 6,000,000 lbs. for both countries.

GERMANY AND AUSTRIA.

The exhibits of wool from Germany and Austria were limited to that variety of the merino fleece commonly known as "Silesian," but more properly called *electoral*, from the Elector of Saxony, — the country in which this wool was first produced. Some beautiful specimens of the electoral fleeces were exhibited from Germany and Hungary, the latter grown by Hungarian nobles. They illustrated all the characteristic features of the

"noble" wool, as it is sometimes called in Germany. The fibres of these wools, according to Moll, measure from 1.4 to 1.8 of a centime of a millimetre in diameter, — a centime of a millimetre being equal to $\frac{1}{2540}$ of an inch. Nathusius-Königsborn, in "Das Woolhaar des Schaf," makes the average measure ten hairs 1.79 centimes, — 1418 to 1 inch. Among these hairs, one hair measured 1. centime, — equal to 2,550 to 1 inch. According to the same author, eighteen hairs of a very high blood ewe averaged 1.53 centimes, or 1,661 to 1 inch. The finest single hair measured 1.17 centimes, — equal to 2,164 to 1 inch. The finest Silesian ram averaged 1.54 centimes. Dr. Georg May, in "Das Schaf" Breslau, 1868, in a table of measurements of fifty-five different kinds of wool, the finest, that of a Silesian super-electer, the very highest electoral wool, to average 0.13 millimetres, — equal to 1,954 hairs to 1 inch. The length of these wools rarely surpasses four centimetres; and the weight of the average of many flocks' fleeces is scarcely over $1\frac{1}{2}$ lbs. They are used at present only for the fabrication of most precious of woollen goods — imitation cashmere shawls, extra-fine broadcloths, &c. The thick felts now made in this country for the hammers of the keys of pianos are made solely of this wool, imported from Silesia, and costing about fifty cents per pound in Europe. It is admitted that this branch of wool production is everywhere diminishing. Saxony, the cradle of the race, has scarcely any of the electoral sheep; Silesia still possesses a considerable number; while others are found in Moravia, Hungary, Prussia, and Poland, which produce all the superfine wools used in Europe. The whole production of the superfine wools of these countries in 1866 is stated by a competent authority as follows: —

	Kil.	Lbs.
Hungary	560,000	123,760,000
Bohemia	110,030	24,310,000
Moravia	55,000	12,155,000
Silesia	85,000	18,785,000
Total	810,000	179,010,000

This small production is due to the small weight of the fleeces,

the great care which the animals require, prices disproportionate to the cost of production, and the loss of that distinction which formerly encouraged the growers of the noble wools. Mr. Bockner, of Austria, one of the judges of this group, is authority for the statement that Count Hunyady, of Hungary, one of the exhibitors of the electoral fleeces at the Exposition, produces 12,000 lbs. annually of these wools; which he sells at 90 cents, principally in France, for the manufacture of imitation cashmere shawls; but, at these prices, there is no profit in the culture. The few growers of this wool in Hungary, who are generally noblemen, continue the production only from motives of pride. Most of the wealthy proprietors who formerly made a specialty of the production have abandoned it, or allowed their flocks to run down.

In no portion of the world have so much science and intelligence been directed to the merino-sheep husbandry as in the German States. Saxony was the first to acquire the Spanish merinos in any considerable number, first receiving them in 1765. In 1774, the pure-blooded progeny of the Spanish importations amounted to 325 head. As the culture of this race extended, there grew with it a desire to increase the characteristic property of the fleeces, or the fineness of the fibre. This passion — as it became — for the utmost possible fineness of fibre, irrespective of all other considerations, led insensibly to the methods of breeding which produced a race possessing this attribute in the highest degree, but with a corresponding delicacy of constitution and lightness of fleece. This race, known in this country as the "Saxon," and in Germany as the "electoral" or "Escorial," — both names being used indifferently, — does not appear to have been the inheritance from any special Spanish Cabanas, but a production of art. The commercial demand produced by the reputation of their wools led the German growers to increase the size of their animals and fleeces. Another race was developed by the side of the other, the ideal of which was a robust body, producing the largest possible quantity of wool of the utmost fineness consistent with the increased production. This race was called the *Negretti*, from Count

Negretti, the proprietor of one of the most celebrated original Cabanas in Spain. It was also sometimes called the *Infantado* race, from the Duke of Infantado; both terms, as in the case of the terms "electoral" and "Escorial," indicating the character of the race, and not its Spanish descent, as is often erroneously held. The descriptive terms "Negretti" and "Infantado" are found at the Exposition applied to wools of the same general character. While Silesia is still in possession of the largest number of the superfine electoral sheep to be found in the whole world, Saxony, Pomerania, Mecklenburg, and Eastern and Western Prussia, in time, renounced the electorals, and replaced them by the Negrettis. Thirty or forty years ago, Germany attained the utmost production that her land would permit. In 1850, according to personal statements made to the writer by Professor Grothe, of Berlin, the number of sheep in all the German States exceeded 50,000,000. At the present time, they do not exceed 25,000,000. Mr. Dodge places the number at 29,000,000. It is said that she is even losing her magnificent merino breeds; for not only the electorals, but the Negrettis, are being replaced by the English long-woolled races. What effect this will have upon the once famous broadcloth manufacture of Germany is an interesting subject of inquiry; while the question suggests itself, what relation this decline of the German fine-wool industry has to the abolition of the former protective duties on imported wool.

AUSTRIA.

The estimated product of wool in Austria, according to returns made at the Exposition, is about 30,000,000 kilogrammes, or 66,150,000 lbs. The number of sheep are not given; but, at 3 pounds of wool per head, the number would be about 22,000,000.

Mr. H. Schwartze and Mr. Dodge give, from returns in 1871, the numbers of sheep as —

In Austria	5,026,898
Hungary	15,076,997
Total	<u>20,103,895</u>

The distribution of sheep in proportion to the area and population in 1869 was as follows : —

	Per Square Kilometre.	Per 1,000 Persons.
Dependencies represented in the Reichsrath	2,476	367
Dependencies of Hungarian Crown	1,639	341
Monarchy	2,048	564

The largest flocks are found in Hungary. Beautiful, superfine clothing wool was exhibited by Count Alvis Karolyr, from flocks bred at Stampfen. This flock numbers 80,000 head. The average length of staple of the fleeces is about $1\frac{1}{2}$ inch; the average weight of the shearings — the fleeces being warm and soap water washed — is, winter lambs excepted, $2\frac{3}{4}$ pounds English. The whole clip — 145,000 to 156,800 lbs. — is sold abroad, mostly to French manufacturers, for from 74 to 85 cents per lb.

RUSSIA.

The wools of Russia were well illustrated at the Exposition by numerous fleeces and bales, and admirably arranged samples. The most interesting were electoral wools, comparing favorably with the Silesian and Hungarian specimens, samples of the Donskoi carpet wools, and a series of beautiful samples from the estate of the Grand Duchess Katharine Michailoona, showing the extraordinary length of fibre obtained from sheep of the Rambouillet race. Sheep husbandry constitutes one of the most important branches of rural economy in the Russian empire. The full statistics obtained from the Russian Commissioners show that the total number of sheep in the empire at the present time is 65,387,000 : —

Europe	49,493,000
Asia	15,894,000
Total	65,387,000

— a number which gives a proportion of sheep of 81 to each 100 inhabitants. The distribution of sheep according to the population in the great divisions of Russia is as follows : —

The provinces of Central Asia have, per 100 inhabitants, 565 sheep.

Caucasus	"	"	124	"
Siberia	"	"	90	"
Russia in Europe	"	"	70	"
Poland	"	"	65	"
Finland	"	"	49	"

Compared with the other great states of Europe, Russia occupies the fourth place.

Great Britain having, per 100 inhabitants, 133 sheep.

France	"	"	97	"
Prussia	"	"	98	"
Russia	"	"	81	"
Austria	"	"	47	"
Italy	"	"	38	"

The total number is composed of 12,555,000 head of merinos, and 52,832,000 common sheep. The principal domain of the merinos is comprised in the governments of New Russia, or those of the south-eastern portion of the empire. The governments of Caucasus, Siberia, and Central Asia have scarcely any, and Finland no, merinos. Georgia and Circassia possess mostly sheep of the ancient Colchican race. Generally considered, the fine-woolled sheep tend to decrease as the increased prices of wheat cause a larger conversion of pastures into arable land. Both the electoral and Negretti races are grown. The small product in wool of the former race, set down at two pounds for the ewe and three pounds for the wethers, has led to extensive crossing with the more vigorous race. The most successful crosses, and that now in most favor, are with Rambouillet rams. The reason given for this predilection is that "this wool responds best to the exigencies of the present wool production, since the clothing industry tends to decrease, while that of worsted tissues takes daily more development."

The culture of merinos in the southern regions of the empire is favored by the mildness of climate ; the sheep requiring shelter and fodder only about six weeks. The greater part of the flocks

is composed of a great number of heads ; single flocks reaching to fifty, seventy-five, a hundred, and even four hundred thousand head. Mr. Falz Feen, one of the exhibitors of excellent wool of the government of Zanride in the Crimea, has 230,000 sheep, all of Spanish blood, occupying 340,000 acres of land. These flocks consist of Negrettis, which appear to have attained in Russia an unusual hardness, which favors their culture in immense flocks, requiring but little of that care so indispensable for the electorals.

The great masses of the common sheep are found in the countries of Central Asia, in the governments of the south-east of Russia in Europe, in the Caucasus, and Siberia. They consist of four races, — Tchoundki, or the fat-tailed sheep, belonging to the nomadic people, the Kalmucks and Kurds ; the Valaque, or the Wallachian or Zakel sheep, which also abounds in Hungary and Moldavia, of a large size, with coarse, lustrous wool ; they are found in the Caucasus, or region of the Don, and probably furnished the wool known as Donskoi ; the Tsigai, commonly spelled Zigai, meaning Gypsy or mongrel, with an exterior resembling merinos, but with longer wool ; the Russian race, of a small size, with coarse wool, — and a sub-race, Retchelof, found at the south of the government of Poltava, which furnishes the black and white fleeces commonly called Astrakan.

The production of the merino wool of Russia in the grease is estimated at 1,569,000 poods, — equal to 56,484,000 lbs. ; of common wool, at 9,245,000, — equal to 332,820,000 lbs., or $6\frac{3}{10}$ lbs. to a sheep : the total having an estimated value of 46,357,000 roubles, or 32,449,000 dollars. The exports of wool are of a value of 13,999,534 roubles, supposed to be about 30,000,000 lbs. washed, — equal to 50,000,000 lbs. unwashed. There is a vast domestic consumption of common wools in the household for clothing, for carpets or mats, and for mattresses ; while the sheepskins are largely used for clothing.

The enormous production of common wools — most of which, such as those from the broad-tailed and Valaque races, are admirably adapted for the carpet manufacture — shows that this

country will be one of the most important sources for the supply of the raw material for this industry.

FRANCE.

The wools of France had no representation at the Exposition, except in fabrics, and in the products of other countries which have been so largely influenced by an infusion of the blood of the French merino. This influence makes it necessary to dwell at some length upon the French wool industry, since it is one of the lessons of the Exposition.

The sheep husbandry of France is unquestionably declining, — at least in numbers. President Thiers said, in 1870, "Our ovine population has gone down from 40,000,000 to 30,000,000." It is stated, on the authority of the Inspector-General of Agriculture, that the number of sheep in France had been reduced from 30,386,000, in 1866, to 24,707,496, in 1872, — a loss of 5,678,787 in six years. President Thiers attributes this decline to the absence of protective duties on wool; others, to the abuse of an absurd law which allows the municipal councils to prescribe the number of head per hectare which each farmer is permitted to keep. The number of merinos, or their grades, producing fine wool, is estimated by M. Sanson at 9,000,000. The other flocks, consisting of indigenous sheep, producing coarse-clothing wools, and some English mutton sheep, have no special characteristics worthy of notice.

The marked feature of the wool industry, or sheep husbandry, of France is the influence it has had upon the combing-wool manufacture of the world, and, consequently, upon the sheep husbandry of all the nations which supply it. Louis XVI. obtained from the King of Spain 200 rams and ewes of the pure race of Leon and Segovia, exactly a century ago; viz., 1776. In 1786, he obtained 367 more, which were the foundation of the famous Rambouillet flock. In 1799, France received, through the treaty of Basle, 5,500 animals from the finest flocks of Castile. Sixty sheepfolds were established by Napoleon, as accessories to that of Rambouillet, where proprietors could obtain the service of merino rams free of charge. The directors

of the national sheepfolds pursued in breeding precisely the opposite course to that adopted with the same original race in Saxony, and with the *Tropeau de Nuz* in France. They aimed to increase the size of the frame and the weight of the fleece. With this increased size and weight, there was developed a corresponding length of fibre; and a merino combing wool was for the first time created. The French manufacturers were the first to avail themselves of this new property of wool, which their own territory supplied. National pride stimulated them to create new fabrics from the new material supplied from domestic sources. They invented mousselines-de-laine merinos, cashmeres, challis, baréges, and, more recently, worsted coatings, — in a word, all the woollen stuffs of the nineteenth century which distinguish themselves in their physiognomy from the tissues of the preceding centuries. The English and other manufacturing nations, in course, followed the French example. Wool, instead of, as formerly, furnishing the material for clothing for one sex, supplied it for both. The Southern Hemisphere responded to this new and increased demand for merino wool; and the fine sheep husbandry of the world was modified to produce the combing-wools required for the new fabrics. To France must be accorded the honor of impressing the most characteristic feature of the sheep husbandry and wool manufacture of the present century.

The scientific breeders of France, not contenting themselves with producing animals surpassing all others of their race in size, and weight of fleece, and length of staple, have more recently aimed to develop, together with the special qualities of the merino fibre, the meat-producing qualities and precocity of development which formerly were regarded as the exclusive aptitudes of the English races. They have succeeded in transforming the merino into the most perfect mutton sheep, having the same precocity, and giving as much meat as the South Downs, reputed to be the best producer of flesh; while, at the same time, the total weight of the fleece is increased, without augmenting the diameter of the fibre. In a word, the merino, while becoming a mutton sheep, preserves all its wool-bearing

qualities. This method of development, requiring, of course, abundant food, should be suggestive to the occupants of the valuable lands in this country contiguous to city markets, where the merely pastoral sheep husbandry has declined.

We must not pass by another product of French sheep husbandry, — perhaps the most instructive, in a scientific point of view, of any in the Exhibition, — as illustrating the wonderful results which the skilful breeder may accomplish by happily improving the accidents of nature. The product referred to is the famous Mauchamp wool, admirable specimens of which, both in staple and yarn, were exhibited by Mr. George W. Bond, who had personally visited the creator of this race in France, from whom he obtained his specimens. The characteristics of this wool are, that to a fineness equal to that of merino, and a length of staple which surpasses it, is added a lustre absolutely comparable to that of silk, — a lustre so marked that, in a challis made with a silk warp and weft of Mauchamp wool, the stuff, which contained only one-eighth of silk and seven-eighths of wool, was as brilliant as if made entirely of silk.

The history of the creation of this race is so instructive that it should be briefly stated. In 1828, there was accidentally produced on the farm Mauchamp, in France, cultivated by M. Graux, a ram from a flock of merinos, having a head of unusual size and a tail of great length, but having a wool remarkable for its softness, and, above all, for its lustre. M. Graux separated the animal from the flock, and used it for reproduction, obtaining some animals similar to the sire, and others to the dam. Taking, afterwards, the animals similar to the sire, and crossing them among themselves or with the sire, which served for the type, he succeeded, little by little, in forming a small flock whose wool was perfectly silky. He afterwards succeeded in modifying the forms and the size of the animals, — originally quite small, — and obtained a flock of six hundred head, all furnishing the silky wool. The flock was prosperous at the time of the breaking out of the Franco-Prussian war. Of its history since that period, we have no knowledge.

Note upon the Sheep and Wool Production of France.

After this portion of the report had left the hands of the writer, he received the following important communication, which had been delayed through misdirection.

Exposition de Philadelphie, Section Française, Commissariat Général.

PHILADELPHIA, Nov. 2, 1876.

Mr. J. L. HAYES, Judge Group IX.

SIR,—I have the honor to forward the information concerning the productions of wool in France which has just been received from the Department of Agriculture and Commerce, by the French Consul General in New York.

I have the honor to be, sir,

Your very obedient servant,

R. ANFOYE,

Dp. Commissioner for France.

PARIS, Oct. 16, 1876.

The last census made in France gives the ovine population as follows:—

CATEGORIES.	1839.	1852.	1862.	1866.	1872.
Béliers . . .	37,571	453,575	508,053	388,940	332,953
Moutons . . .	9,462,180	9,613,446	9,378,067	8,066,956	5,851,695
Brebis . . .	14,804,946	14,496,010	14,572,430	14,324,456	11,510,310
Agneaux . . .	7,308,689	8,919,551	5,076,128	7,607,880	6,982,520
Total . . .	31,951,430	33,481,592	29,529,678	30,388,232	24,677,478

The diminution of the number of animals of the ovine species grown in France results from different causes, of which the principal are,—the selling or the location of the common lands; the progress of the parcelling out of the proprietary lands; the abolition of the right of free pasturage; the suppression of the heath lands; and, finally, the clearing up of the waste grounds upon which sheep were formerly fed. Nevertheless, the census of 1872 represents a very great diminution; which we must acknowledge, in order to explain so high a variation, this being 5,710,754; as the part of the territory annexed to Germany did not contain more than 344,000, which is far from the number of five millions. But if the number of the ovine population has greatly diminished in a very marked proportion, the average value of the

sheep for the entire species, which was nine francs eighty centimes in 1839, can now be estimated at twenty francs.

The departments most rich in animals of the ovine species are l'Aisne, les Pas de Calais, la Somme, l'Oise, la Marne, les Ardennes, la Seine Inférieure, l'Eure, l'Eure et Loire, la Seine et Marne, la Seine et Oise, l'Yonne, l'Indre, l'Avignon, la Geuse, le Cantal, &c.

The mean weight of the fleeces of France in the *suint* can be fixed at two kilogrammes for the rams, wethers, and ewes; and at 820 grammes, for the lambs. Then, by taking the figures of the census of 1872, we shall have the number 41,115,582 kilogrammes. But to this number it is proper to add the animals slaughtered during the year, not enumerated, which nevertheless have given a certain quantity of wool, valued at 6,176,874 kilogrammes. It follows, then, that the annual production of the wool of France is 47,292,456 kilogrammes. Making two francs the average price of a kilogramme of wool in the *suint*, we have the number 94,584,912 francs as the total value of the wool product of France.

ENGLAND AND CANADA.

England.—The English wools were illustrated at the Exposition by the beautiful collections of the wools of commerce of Messrs. Bowes, of Liverpool, and Bond, of Boston; and, at a later period, by an admirable series of fleeces forwarded from Bradford, through the influence of one of our colleagues, Mr. Mitchell.

The names and prices of these wools are given below :—

Half-bred Wether	15½	Leicester Wether	16
" Hogget	16½	Shropshire Hogget	16½
Somerset Wether	16½	" "	18½
" "	16	Kent Wether	16½
Lincoln "	16	Northumberland Hogget	17½
" Hogget	18	Gloucester Hogget	16
N. Hampton Wether	15½	" Wether	15
" Hogget	16½	Irish Hogget	17½
Yorkshire Wether	16½	Devon (Lustre) Wether	17½
" Hogget	19	Hereford Wether	16½
South Down Ewe	16		

The characteristics of the fibre of all the many English races were well displayed in these collections. It is unnecessary to say that England produces no merino sheep, and

that they are all grown primarily for mutton, and secondarily for the wools; the latter being generally used for combing purposes, and entering into the manufacture of a large class of worsted goods. The wools of English races, — the Leicesters and Lincolns and Cotswolds, — for length, strength, and lustre, present the best type of combing wool proper, or that used exclusively for combing-wool purposes. The lands being stocked with sheep to their utmost capacity, the numbers of sheep vary but little from year to year; so that returns of a few years back will pretty fairly represent the present production. The government returns of 1868 show the whole number in England, Wales, Scotland, and Ireland to be 34,532,000; which are classified by Mr. Graham as follows, according to the leading typical races: —

Leicesters and their allies	12,933,000
Downs "	6,130,000
Cheviots "	4,368,000
Black-faced "	5,101,000
Welsh	2,000,000
Irish	4,000,000
Total	34,532,000

The production of these races in wool is thus estimated.

Leicesters	12,933,000 fleeces	at	7 lbs. each	90,531,000
Downs	6,130,000 "	at	4 "	24,520,000
Cheviots	4,368,000 "	at	8 "	13,104,000
Black-faced	5,101,000 "	at	2½ "	14,027,750
Welsh and Irish	6,000,000 "	averaging	2 "	12,000,000
84,532,000				
Total number of pounds washed wool				154,182,750

At an average price of 10*d.* per pound, the value of the wool product is £6,425,000. Taking the average age of these sheep at three years, about one-third, or 11,510,000, are killed for mutton, annually. Averaging the carcasses at 65 pounds, and the price per pound 8*d.*, there are produced, annually, 748,150,000 pounds of mutton, realizing £25,000,000 per year. This, added to the annual value of wool, 6,425,000, makes the product of British sheep

£31,425,000, or \$159,125,000. To this is to be added the value of the manure, which can only be estimated by the fact that it is an indispensable necessity for British husbandry.

This estimate would be greatly increased if we add, as should be done, the value of wool from slaughtered sheep, — say 36,000,000 lbs., — and estimate the value of the wool at 15*d.* instead of 10*d.*, which would be nearer the correct figure at the present time.

The Dominion of Canada. — The long-combing wools of English blood exhibited by Canada attracted the high commendation of the judges. An exhibit from Hamilton, showing Leicester, Cotswold, and South Down wools, and that of crosses of Leicester and Merino, Leicester and South Down, Cotswold and Leicester; Lincoln and Cotswold, justified the popularity of these wools with the worsted manufacturers of the United States. So prevalent is the culture of the long-combing wools in Canada, and so large their consumption in the United States, where they find their principal market, that the term "Canada wools" is in general use to designate the wools of the English type.

We are indebted to the Minister of Agriculture of the Dominion of Canada for the latest official returns made in 1871, which furnish the following statistics as to sheep and wool production.

PROVINCES.	Number of Sheep.	Pounds of Wool.
Ontario	1,514,914	6,411,305
Quebec	1,007,800	2,763,304
New Brunswick	234,418	796,168
Nova Scotia	398,377	1,132,703
Total	3,155,509	11,103,480

OTHER EUROPEAN COUNTRIES.

No exhibits of wool were made by Italy; which has, according to Messrs. H. Schwartze & Co., 6,977,104, and, according to Mr. Dodge, 11,000,000, sheep. Portugal, which has about

3,000,000 sheep, made some excellent exhibits, and is declared by her commissioners to be pursuing sheep husbandry with a freshly awakened zeal and energy. Spain, which has according to both the authorities above mentioned about 22,000,000 sheep, made a considerable number of exhibits of wool. But the observer could not fail to be struck with the fact, that the merino wools exhibited by the country which was the cradle of the merino race showed no evidences of their pristine excellence, — a fact illustrating that the gifts of Providence cannot be preserved without human care, and that material progress cannot continue in the midst of political revolutions.

UNITED STATES.

It is a subject of very great regret that the wools of the United States were so inadequately represented at the Exposition. This was in some measure accounted for by the circumstance, that the annual shearings had not taken place at the time when, by the rules of the Exposition, the entry of exhibits was closed. At the request of the judges of this group, an extension of time was granted to proposed exhibitors of wool, but with little effect. The few beautiful fleeces (especially from Ohio), but, more than all, the high character of American flannels, blankets, and fancy cassimeres, made exclusively of domestic wool, — were sufficient to impress our foreign associates with the value of our wool product. The interest manifested by them leads to the belief, that some details respecting the American wool industry which may be quite familiar to our own people will be acceptable to the foreign readers of this report.

The number of sheep in the United States is set down in the census returns of 1870 at 28,777,951 ; and the quantity of wool produced, at 100,102,387 lbs. It is believed that these returns are incomplete, as they only give an approximation of the number of sheep actually on farms at the dates of the returns, and were imperfect in respect to Texas and the Territories ; while the amount of wool is also incomplete, as the returns of fleeces of sheep slaughtered in cities is not given. The statistician of the Agricultural Department, Mr. Dodge (whom the writer has

consulted), who has made a special study of the subject, estimates the number of sheep in the United States, at the present time, 1876, at not less than 36,000,000; producing, with the additional fleeces of those slaughtered within the past year, 155,000,000 pounds.

The sheep of the United States consist,—1st, of what are called the native sheep, which are descendants of the unimproved, coarse-woolled English sheep first introduced. It is not known to what particular type of the English races they originally belonged; although it is known from tradition that certain of the common sheep were held in particular esteem for producing long-worsted wools, which were hand-combed and spun in the families of New England, for making yarns for worsted stockings. These sheep furnished the stock upon which the merinos were engrafted. 2d. Descendants from the more recent English races, principally brought immediately from Canada. 3d. The Mexican sheep found in Texas, New Mexico, Colorado, and California,—a coarse and sparsely-woolled sheep, of Spanish descent, undoubtedly of the race known as Chourro. 4th. The merino sheep and other grades. The latter constitute the principal and characteristic sheep of the United States.

Six merinos were introduced to the United States, by different persons, between 1793 and 1802. In the last-named year, Mr. Livingston, the American Minister in France, sent home two pairs of merinos obtained from the French government flock. Later, in 1802, Colonel Humphreys, the American Minister in Spain, on his return from his embassy, shipped a flock to the United States, of which twenty-one rams and seventy ewes reached his farm in Connecticut. It is not known whether the merinos imported prior to these left any descendants; although it is known that the merinos proceeding from the imports of Mr. Livingston sold for enormous prices. The next, and by far the most important, acquisition was secured in 1809–10, through the energy and fortunate position of Mr. William Jarvis, American Consul at Lisbon, in Portugal. In consequence of the invasion of Spain by the French, and the subsequent confiscation and sale by the junta from celebrated flocks of merino sheep, Mr. Jarvis

was enabled to purchase a large number, — about three thousand five hundred, — which he sent to this country, and sold, except a few hundred, which he placed on his own farm in Wethersfield, Vermont, where they or their descendants have remained ever since. Four of these sheep were presented to Mr. Jefferson, at Monticello, who thus responded : "The four merinos are now safe with me here, and good preparations are made for their increase the ensuing year. Pursuing the spirit of the liberal donor, I consider them deposited with me for the general good ; and, divesting myself of all views of gain, I propose to devote them to the diffusion of the race throughout our State. As far as their increase will permit, I shall send a pair to every county of the State in rotation, until the whole are possessed of them." In 1810–11, there was an additional importation of about two thousand five hundred merinos, — all from the prime flocks of Spain ; part of which went to New York, and part to Boston.

The merinos arrived at a propitious time for their favorable reception. It was a period when our foreign trade was suspended by the embargo, and our people were driven to supply themselves with fabrics from their own resources. They hailed with eagerness the opportunity of supplying and improving the raw material for the wool manufacture, in which they had embarked. The Spanish rams were eagerly sought to improve the common sheep ; and flocks of full blood and grades were established in all parts of the country.

Although the mania for merino growing — which rose so high during the war of 1812 that from \$1,000 to \$1,500 was not unfrequently paid for merino bucks — was checked by the peace of 1815, and the destruction of our wool manufacture by the flood of importations, while many of the flocks were merged in the common, coarse sheep of the country, others were kept pure and separate, and the race was firmly established on our soil.

In 1824, a new impulse was given to our wool manufacture through legislative influence. Factories on a large scale were established for making broadcloths. The fashion of the times

required cloths of great fineness ; such as were made in England and France from the wools of German electoral sheep husbandry, which was then at the height of its prosperity. The necessities of the broadcloth manufacture required a finer wool than was supplied by Spanish merinos, as they were then commonly called. Saxon or electoral merinos were imported in large numbers. The record is preserved of 2,963, which were imported in four years. The first aim of the wool-growers thence, for a period of fifteen years, was to engraft upon their flocks the Saxon blood ; though, fortunately, a few never entirely abandoned the old merinos.

Through the effect of general causes which insensibly led to the decline of superfine sheep husbandry in all the merino wool-producing countries of the world, there commenced in the United States, about 1835, a reaction in favor of the neglected, old-fashioned merinos. Intelligent growers abandoned improvement through the Saxon stock, and sought for stock animals those of undoubted descent from the early Spanish importations.

From this period the improvement of the American merinos (as they began to be designated), especially in weight of fleeces, was rapid. To give an illustration by no means exceptional : In 1863, a flock of 157 two-year-old and yearling ewes yielded 7 lbs. 2 oz. of fairly-washed wool per head. In 1885, the choicest flocks yielded $4\frac{1}{2}$ lbs. of wool per head. In 1844, flocks of the same proportions yielded 5 lbs. 13 oz. of washed wool per head. In that year, at the International Exposition of Hamburg, the first prizes for the best heavy-woolled sheep, rams, and ewes, of 1761, competing animals, were awarded to Mr. Campbell, of Vermont, who exhibited American merinos. In 1875, a flock of 33 ewes, in Michigan, produced 318 lbs. of washed wool. At the American Wool-Growers Association, in 1875, the premiums were awarded, with the following report : —

	Weight of Sheep. lbs.	Weight of Fleece. lbs. oz.	Age of Sheep.
1st Premium Ram	180 $\frac{1}{2}$	29	11 mo. 21 days.
2d " "	148	28 18	1 year 4 "
1st " Ewe	108	17 8	11 mo. 22 "
Two-year-old Ewe not entered for premium	22	8	1 year 5 "

Two races of our merinos have acquired special celebrity : the Atwood family, improved, descended from Colonel Humphreys's importation, and supposed, upon somewhat equivocal authority, to be of the ancient Spanish stock belonging to the Duke Supantado ; and the Rich family, supposed to inherit Paular blood. All these alleged descents are believed to be equivocal and uncertain. The Wells and Dickinson, of Ohio, partially descended from Colonel Humphreys's sheep, samples of whose excellent wool were shown at the Exposition, have had much influence upon the early flocks of the Western States.

The most eminent improver of the American merino was Mr. Edwin Hammond, of Vermont, who bred upon the Atwood stock ; of whose work it is enough to say, that he effected as marked improvements in the merino as were made by Bakewell and Elman, respectively, upon the Leicesters and Downs of England. We find in this brief review the names of Livingston, Humphreys, Jarvis, and Hammond, who are to be specially honored as founders of American sheep husbandry. To this last should be added that of Henry J. Randall, of Cortland Village, N. Y., recently deceased, — a practical shepherd and a scholar. His example and his writings, which have contributed so much to elevate the pursuit of wool-growing in this country, are among the best fruits of the American sheep husbandry.

The special application of American wools will be considered under the head of fabrics. We will advert to one general attribute which is universally conceded to them ; viz., their soundness and strength of fibre. This, and perhaps the great development of fleece and weight, are to be attributed less to the skill of breeders and character of our soil and climate, than to the prevailing system of keeping and the careful and thrifty habits of our people. The flocks, being generally small, are under the personal care of the proprietors. They are housed in winter, and regularly and abundantly fed ; and, consequently, produce a healthy and sound fibre. Thus, our wools owe their best distinguishing attribute indirectly to social or moral causes.

It would be seen that our merino wools, as a rule, belong to

the class of intermediary wools produced in Europe by the Negretti race, now so generally prevalent in most merino wool-producing countries, *and increasing in others*. Many of our manufacturers complain of the falling off of our fine-wool production. The American wool-grower will have seen little at the Exposition to induce him to change his present system. He will find that the cloth industry of the world is adapting itself to the intermediary wools, such as he produces: even fashion yields to economical necessities. The superfine wool production is unnatural, artificial, and unprofitable. From the nature of things, there can be no reasonable expectation of seeing it revived in this country. So small is the consumption of the superfine wools, that what might be imported from abroad would hardly compete with American wools; and, if it were possible so to distinguish them that there should be no possibility of fraud or evasion, they might, without injury to the wool-grower, be placed on the same scale of duties as carpet wools, neither being advantageously produced here.

The reader would naturally look for particulars as to the distribution of sheep in the several States of our territory, with observations as to the characteristics of the wool in different States, as influenced by soil and climate. These particulars the writer hoped to supply, and, with this view, addressed letters of inquiry to each of the commissioners from the wool-growing States. The information obtained was so meagre, while no other sources of accurate information were accessible, that he has been compelled to abandon his purpose. The wools of many of our States have characteristic qualities, readily recognized by inspection and touch; but the most skilled expert would be unable to define, in language intelligible to the unskilled, differences which to him are perfectly palpable. The deficiency as to the distribution of sheep in the several States is approximately supplied by a statement which accompanied an admirable exhibit of samples of wools from most of the States and Territories of the Union, made by Messrs. Fiss, Banes, and Erben, of Philadelphia. This exhibit, made at the special request of the Superintendent of the Agricultural Department

of the Exhibition, was received too late to obtain what it eminently deserved, — an official award. The samples were well arranged and exceedingly instructive, especially as supplemented by the estimate of the number of sheep which these gentlemen were so capable of giving with near approach to accuracy.

Their estimate is as follows :—

STATES.	No. of Sheep.	STATES.	No. of Sheep.
California	6,750,000	New Jersey	125,800
Delaware	23,600	New York	1,936,500
Georgia	271,300	Ohio	4,546,600
Illinois	1,311,000	Oregon	710,500
Indiana	1,250,000	Pennsylvania	1,640,500
Iowa	1,663,900	Rhode Island	25,300
Kansas	128,900	Tennessee	341,700
Kentucky	688,600	Texas	1,691,500
Louisiana	66,800	Vermont	490,500
Maryland	141,200	Virginia	356,400
Massachusetts	76,300	West Virginia	544,500
Maine	226,900	Wisconsin	1,162,800
Michigan	3,450,600	Colorado	not given.
Missouri	1,284,300	Utah	"
Nebraska	46,900	Wyoming	"
New Hampshire	242,200	Montana	"
Total	17,615,300	Total	13,572,600
		Grand total	31,187,900

In the census of 1870 the number of sheep were : in Colorado, 120,928 ; Utah, 59,672 ; Wyoming, 6,409 ; Montana, 2,024 : total 189,033.

The following States and Territories were not represented. We place against them the number of sheep as given in 1870 ; since which time, some of them, and the four above, have immensely increased their flocks :—

STATES AND TERRITORIES.	No. of Sheep.	STATES AND TERRITORIES.	No. of Sheep.
Connecticut	83,884	South Carolina	124,594
Minnesota	133,343	Washington Territory	44,063
New Mexico	619,438	Mississippi	232,732
North Carolina	463,435	Florida	26,589
Total	1,300,100	Total	427,986
		Grand total	1,728,086

There are some general considerations relating to American sheep husbandry, not yet referred to, which should not be omitted.

Sheep husbandry, in the older States, is apparently declining, or is rather in that state of suspense which precedes a transition to another form. In most of the New England States the number of sheep has greatly diminished, as in Connecticut, New Hampshire, and Rhode Island. Massachusetts — though ranking seventh in numbers and first in density of population — having, by the State census of 1875, a wool product of but 206,935 lbs.

Vermont, however, still occupies an important position as a sheep-producing State; and, in one respect, the first. The distinctive character of the sheep husbandry of Vermont is the breeding of merino sheep, and especially of rams for exportation to other States and abroad. The influence of Jarvis and Hammond, and of the choice flocks of the purest Spanish races introduced by the former, is felt throughout the State. The objection has been made to the Vermont merinos, that, with the object of obtaining heavy fleeces, there has been an undue development of yolk. The best breeders — prominent among whom is Mr. George Campbell, of Westminster — are now working in a different direction. They are breeding so as to destroy the wrinkles formerly so popular as indicating a pure blood, — but really useless, unsightly, and inconvenient in shearing, — to diminish the quantity of the yolk, and to make a hardy animal, fitted specially for regenerating the flocks kept in a state of exposure in Colorado and California. Vermont sheep at the Exhibition having attracted the favorable attention of the Commissioners from Australia, the wool-growers of the State subscribed for the purchase of a model ram and ewe which they have courteously presented the Agricultural Society of New South Wales.

The most remarkable event in the recent history of our wool industry is the rapid development of the pastoral-sheep husbandry in California and the trans-Missouri States. While in the older States wool-growing has been pursued with small

flocks as an adjunct to other husbandry, in these States it has been organized on a grand scale. It is conducted, not by farmers, but by exclusive wool-growers, who are at the same time capitalists. There are single proprietors who have flocks exceeding a hundred thousand head in number. In 1868 the Pacific product was 15,000 lbs. ; in 1870, 23,000,000 lbs. In 1875 the product of California exceeded 50,000,000 lbs. The product for 1876 is stated as follows, by E. Grisar & Co. : —

	Pounds.
Spring wool, 94,102 bales, weighing	28,230,000
Spring wool shipped direct from the interior	1,834,919
Total spring production	30,065,519
Fall wool received, 78,962 bags, weighing	24,031,378
Fall wool shipped direct from the interior	204,073
Total fleece wool	54,300,970
Pulled wool shipped direct from San Francisco	2,250,000
Total wool production of California in 1876	56,550,970

The wool is rapidly improving, and is in high demand. The great ranges of pasturage in the Pacific and trans-Missouri States, and the very little winter housing and feeding of forage required, give promise of a development of sheep husbandry in those territories comparable to that of the Southern Hemisphere. Conditions not less favorable, which are beginning to attract the attention of experienced wool-growers, exist in the vast area and favorable climate of Texas.

Mutton Sheep Husbandry. — No reference has yet been made to a branch of our sheep husbandry which promises to take the most prominent place in the older States, — that of the long-woolled or mutton races, or their crosses with merinos. The culture of these sheep, which is of recent introduction, dating back hardly more than twenty years, has been largely influenced by the contiguity to Canada, and the development of our worsted industry within the period mentioned. It has been peculiarly successful on the southern shores of Lake Erie, and in the States adjoining Canada. From returns furnished by the State commissioners, it appears that, of about 1,100,000 sheep in Wisconsin,

about one-quarter is of the long-woolled race. Of 8,000,000 pounds produced in Michigan in 1875, about one-quarter is of the same race. In both States, the culture of these wools is declared to be on the increase. In Oregon, of 2,000,000 pounds produced in 1875, the quantity of long-combing wools was in the same proportion. The exhibits from this State show remarkable success in breeding and actually improving the English wools, while the climate shows peculiar adaptation for this product. Kentucky, favored by its blue-grass pastures, is also distinguished for the excellence and abundance of her long-combing wools. It has been proved by the best test, — that of actual trial, — contrary to the belief formerly prevailing, that our soil and climate are well adapted to these heavy sheep. The high prices of the wools, the increasing demand for good mutton, and the benefits to the soil, cannot fail to induce the farmers of the older sections of the country to follow the example of England. A new feature in our foreign commerce, effected by the recent invention which permits the transportation of fresh meats — hung in apartments suitably arranged — to great distances on ship-board, and the favor with which American beef and mutton, thus introduced, has met in England, presents unexpected inducements for mutton-growing in our Atlantic States.

Other English races not yet introduced, especially the Cheviot, should be tried. It is believed that this race is specially fitted for the high plateaus of North Carolina, where they would find a climate approximating that of their native locality. The mere acclimation and continuance of the English types is not sufficient. Attempts should be made to create new races of this class of sheep exactly adapted to our climate, manufactures, and conditions of agriculture. No wider field for zoötechnic achievements is offered than in this direction.

This sketch would be incomplete without some reference to the literature of American sheep husbandry. The most eminent and influential worker upon this subject is Dr. Henry S. Randall, lately deceased, who, by his writings and example, has done more than any other to elevate what was once a neglected and incidental pursuit of the farmer to a cherished and

dignified employment. His "Practical Shepherd" has been pronounced the best book ever published on any branch of agriculture. Other eminent writers on this subject are Hon. George Geddes, whose contributions have appeared in the "New York Weekly Tribune;" Mr. A. M. Garland, of Illinois, the editor of the sheep department of the "Live Stock Journal,"—at present the fullest and most reliable source of information, valuable to American wool-growers; and Messrs. Glenn & Co., of Pennsylvania, contributors to the "Practical Farmer." "The Bulletin of the National Association of Wool Manufacturers," in six volumes, has notices of much of the foreign literature bearing upon the subject, with discussions of the economical questions bearing upon American wool industry. It contains, besides, essays by the most practical and scientific of American experts on wool fibre, — Mr. George William Bond. Several of the most recent reports of the State boards of agriculture contain essays of much value, particularly those of the States of Maine, Vermont, and Georgia. The reports of the National Department of Agriculture, though last named, occupy the first position as sources of knowledge on the subject of sheep husbandry, — a position mainly due to the accomplished statistician of the Department, Mr. J. R. Dodge.

RESUME OF WORLD'S PRODUCTION.

Having considered, with as much detail as is permitted by the limits of space allotted to a single group, the wool production of the countries represented at the Exhibition, we are impelled to re-enforce the first great lesson to be drawn from an International Exposition, — a conception of the world's resources in industrial material, — and to sum up, in a comprehensive statement, a *résumé* of the wool product of all countries, independently of their display at Philadelphia. We find this work already prepared for us by authorities so high in wool statistics as to make any apology for its insertion, or the space it occupies, unnecessary.

Messrs. H. Schwartze & Co., of London, in the annual report dated Jan. 18, 1877, say as follows:—

An attempt is made in the following to give a survey of the wool trade in its largest proportions. Usually the view is confined to one market or to one country, or to colonial or home grown wools, as the case may be. Here, however, the circle is expanded to include all wools and all countries as far as information reaches, or even as data exist upon which reasonable guesses may be based. To arrive at such a view, the most obvious way would have been an inquiry into the total quantity of wool produced in the world. But, though we give an estimate of the number of sheep in existence, the figures are in several points too uncertain to allow of any conclusions being built upon them. It is nevertheless possible to obtain a view of the trade in its entirety in another way; viz., by ascertaining, not the production of wool which takes place all over the globe, but the quantity worked up by the whole wool industry, which, so far from being distributed over the whole earth, is in a developed form practically confined to Europe and North America. This has accordingly been done. Europe and North America are the manufacturers for the whole world; and, if the extent of their work can be gauged, an idea is really given of the entire trade. The subject resolves itself into an inquiry, first, of the home production of these two continents, and then of their imports; the two together giving the measure of the whole. Expressed in millions of pounds weight, we find:—

	1875.	1866.
The home production of Europe and North America . . .	830	798
The imports into Europe and North America	619	419
	1,449	1,217

1,449,000,000 pounds, then, represent the whole supply; and, of this total, about 57 per cent were of European and North American home growth, and about 43 per cent imported.

Apportioning this huge quantity, we find that no less than 351,000,000 pounds, or very nearly a quarter of the whole, fall to the share of the British industry alone; the rest of Europe takes 844,000,000 pounds, or 58 per cent; North America, 254,000,000 pounds, or 17½ per cent. In 1866, the total consumption of raw wool was 1,217,000,000, against 1,449,000,000 pounds in 1875; and the average annual increase was consequently about 2 per cent. Of this, about 1 per cent was directly owing to the increase of population, which in Europe and North America rose from 321,000,000 to 347,000,000 in the stated period; the remaining 1 per cent being due to the employment of wool to new purposes, and to the spread of comfort and wealth generally. Calcul-

lated per head of population, the consumption of raw wool in 1875 was $4\frac{1}{10}$ pounds; or, taking the wool in its cleaned state, $2\frac{3}{10}$ pounds.

It need not be said that all these figures pretend to no accuracy, but are open to correction. All they lay claim to is this: that, wherever possible, they are based upon the latest authentic returns; and that, where such basis was wanting, the estimates have been made with care, and with a full consideration of all points involved.

ESTIMATE OF THE NUMBER OF SHEEP IN THE WORLD.

	Year of Return.	No. of Sheep.
United Kingdom	1876	32,262,579
Russia	1870	48,132,000
Sweden	1873	1,695,434
Norway	1865	1,706,894
Denmark	1871	1,842,481
Iceland	...	800,000
Germany	1878	24,909,406
Austria	1871	20,103,806
Switzerland	1866	447,001
Holland	1878	901,515
Belgium	1866	586,097
France	1872	24,589,647
Italy	1874*	6,977,104
Spain	1865	22,064,967
Portugal	1870	2,706,777
Total Europe (excluding Turkey and Greece), about		190,000,000
Australasia	1875	62,000,000
Cape	Estimate	16,000,000
River Plate	"	60,000,000
North America	"	50,000,000
Remainder of America	"	6,000,000
Total		384,000,000
Turkey, North Africa, Persia, &c., say		65,000,000
India and China, say		85,000,000
Grand total		484,000,000

* Recent statistics place them at 9,000,000. See Report of the Department of Agriculture for November and December, 1876.

CONSUMPTION OF RAW WOOL IN EUROPE AND NORTH AMERICA.

In Millions of Pounds Weight: thus, 247.7 = lbs. 247,700,000.

	1875.	1874.	1873.	1872.	1871.	1870.	1869.	1868.	1867.	1866.
<i>Production of W. Europe and No. America:</i>										
United Kingdom	162	167	165	166	162	168	165	172	168	145
Continent	462	464	473	476	480	485	490	495	501	504
British North America	13	18	13	13	13	18	12	12	12	12
United States	198	178	175	160	146	163	162	177	160	137
<i>Total production</i>	<i>830</i>	<i>822</i>	<i>826</i>	<i>804</i>	<i>791</i>	<i>819</i>	<i>829</i>	<i>856</i>	<i>836</i>	<i>798</i>
<i>Imports into Europe and North America: —</i>										
From Australasia	247.7	220	192.6	185.2	183.1	175.1	158.6	155.7	133.5	114.6
" Cape of Good Hope	50.6	48.7	48.6	68.1	52	42.8	41.8	89.3	38.6	38
" River Plate	207.9	208.5	230.7	212	198.7	185.2	205.6	198.8	171.8	157.2
" West Coast of South America	7.7	7.5	7.6	10.4	8.1	7	8	9	11.6	8.6
" Turkey and North Africa	66.6	60.6	70.4	86.4	70.1	88.2	44	52.1	51.5	62.4
" East India	22.8	19.2	19.8	18.9	19.7	11.3	18.8	17.6	16.3	26.3
" Other Countries	4.8	5.3	4.8	6.7	5.7	6.8	5.3	5	4.1	8.9
Imports of Alpaca	4.2	4.2	4.4	8.8	3.6	8.9	8.3	1.8	8.5	3.6
" Mohair	6.8	8	0.3	6.5	8.7	3.1	4.5	7	2.7	4.4
<i>Total imports</i>	<i>619.1</i>	<i>591</i>	<i>584.7</i>	<i>587</i>	<i>549.7</i>	<i>472.4</i>	<i>489.9</i>	<i>486.3</i>	<i>482.6</i>	<i>419</i>
<i>Production of Europe and North America</i>	<i>830</i>	<i>822</i>	<i>826</i>	<i>804</i>	<i>791</i>	<i>819</i>	<i>829</i>	<i>856</i>	<i>836</i>	<i>798</i>
<i>Imports into " "</i>	<i>619.1</i>	<i>591</i>	<i>584.7</i>	<i>587</i>	<i>549.7</i>	<i>472.4</i>	<i>489.9</i>	<i>486.3</i>	<i>482.6</i>	<i>419</i>
<i>Grand total</i>	<i>1449.1</i>	<i>1413</i>	<i>1410.7</i>	<i>1391</i>	<i>1340.7</i>	<i>1291.4</i>	<i>1318.9</i>	<i>1342.3</i>	<i>1298.6</i>	<i>1217</i>
<i>Consumption of United Kingdom</i>	<i>851.3</i>	<i>863.6</i>	<i>858.5</i>	<i>824.1</i>	<i>836.7</i>	<i>822.7</i>	<i>299</i>	<i>317.2</i>	<i>299.6</i>	<i>812.5</i>
" Continent	843.7	812.3	816.7	793.9	768	762.2	801.2	811.1	768.7	696.5
" North America	254.1	237.1	235.5	278	241	206.5	218.7	214	205.3	208
<i>Total consumption of raw wool</i>	<i>1449.1</i>	<i>1413</i>	<i>1410.7</i>	<i>1391</i>	<i>1340.7</i>	<i>1291.4</i>	<i>1318.9</i>	<i>1342.3</i>	<i>1298.6</i>	<i>1217</i>
<i>Estimated yield of clean wool after washing</i>	<i>816.2</i>	<i>719.3</i>	<i>794.3</i>	<i>784.2</i>	<i>701.1</i>	<i>733.8</i>	<i>746.4</i>	<i>701.3</i>	<i>724.4</i>	<i>699.2</i>

CONSUMPTION OF RAW WOOL, &c. — *Continued.*

	1876.	1874.	1873.	1872.	1871.	1870.	1869.	1868.	1867.	1866.
	Percentage of total consumption.	Percentage of total consumption.	Percentage of total consumption.	Percentage of total consumption.	Percentage of total consumption.	Percentage of total consumption.	Percentage of total consumption.	Percentage of total consumption.	Percentage of total consumption.	Percentage of total consumption.
Production of Europe and North America	57.8	58.2	58.6	57.8	59	63.4	62.8	63.8	65.9	65.6
Imports into " " "	42.7	41.8	41.4	42.2	41	80.6	87.2	30.2	84.1	34.5
	100	100	100	100	100	100	100	100	100	100
Consumption of United Kingdom . . .	24.2	25.7	25.4	28.8	25.1	25	22.7	23.6	23.6	25.7
" " Continent	58.2	57.5	57.9	57.1	56.9	50	60.7	60.5	60.2	57.2
" " North America	17.6	16.8	16.7	19.6	18	16	16.6	15.9	16.2	17.1
	100	100	100	100	100	100	100	100	100	100
Estimated population of Europe and North America	Millions. 347	Millions. 344	Millions. 341	Millions. 338	Millions. 335	Millions. 333	Millions. 330	Millions. 327	Millions. 324	Millions. 321
	Lbs. and decimals. 4.18	Lbs. and decimals. 4.11	Lbs. and decimals. 4.14	Lbs. and decimals. 4.11	Lbs. and decimals. 4	Lbs. and decimals. 3.88	Lbs. and decimals. 4.—	Lbs. and decimals. 4.10	Lbs. and decimals. 3.91	Lbs. and decimals. 3.80
Consumption of raw wool per head of population	2.35	2.32	2.33	2.32	2.27	2.20	2.26	2.33	2.23	2.18
Consumption of clean wool per head of population										

NOTE. — All figures relating to Europe exclude Turkey and Greece.

It will be observed, that, in the preceding statement, the production and consumption of the United States are included in that of North America. In order to bring our own consumption into more distinct relief, the writer has requested Mr. G. W. Bond — than whom no one is more competent to the task — to estimate the consumption of wool *per capita* in the United States as compared with that of Great Britain, and has been favored with a reply. Deeming it unnecessary to confuse the reader with a statement of the complicated calculations by which Mr. Bond formed his estimate, we give simply the results. Of domestic wool, and that imported either in the form of wool or fabrics, the average consumption by the people of Great Britain is set down at three and two-thirds pounds of clean wool per head. The consumption of clean wool in the United States is set down at four and one-third pounds per head.

Although the tables above given may surprise enthusiasts by showing how gradually the consumption of the raw material of the wool manufacture of the civilized nations increases, it being at the rate of but about two per cent for each year of the last decade, it shows progress and stability of progress; it shows that wool is holding and likely to hold its place among the few great natural staples which make up the bulk of commercial commodities; and that a great step towards commercial and industrial independence is made by the nation which has planted a prosperous sheep husbandry upon her soil.

Respectfully submitted,

JOHN L. HAYES.

PART II.

WOOL FABRICS.

CLASS 235. — *Card-Wool Fabrics, — Yarns, Broadcloth, Doeskins, Fancy Cassimeres, Felted Goods, Hat Bodies.*

IN considering the different classes of the manufactured products of wool at the Exhibition, it will be inconvenient, if not impracticable, to observe the geographical arrangement pursued in discussing the raw material. The peculiar national distinctions are less marked than in the raw material, and the products of some countries exhibit nothing calling for particular remark. It would be interesting to give the statistics of production of the different countries exhibiting; but these were not obtainable from any sources at our command.

The fabrics of the class now under consideration, with the exception of yarns and hat bodies, may be properly designated as "cloths." The most marked impression made by an examination in detail of the cloths of different countries was the cosmopolitan character of the cloths of all manufacturing nations. Although there are marked distinctions in the kinds of cloths, the kinds seem to bear the impress of the time, or the fashion of the time, rather than of the country of fabrication.

This is especially true of the great mass of cloths for general consumption, which can be scarcely distinguished except by the degrees of perfection in their fabrication. It has been remarked, that woollen cloths, by their universal use, have tended to obliterate the outward social distinctions of classes. It was ob-

servable at the Exhibition, that they served to obscure the distinction of nationalities. This uniformity may be partially due to the supremacy of fashion, made more universal by modern facilities of communication; but equally to the identity of modern machinery, and the influence of the raw material (adverted to in Part I.) upon manufactures.

In the last, and in the early part of the present, century, scarcely any fabrics were known under the designation of "cloths," except broadcloths, and twilled fabrics similar in face to broadcloths, called "cassimeres." Each piece was uniform in color. Variety of color and shade was the only element which the manufacturers had at command to satisfy the taste for change or the caprice of fashion. The principal distinctions were in the fineness and perfection of finish.

From the descriptions which remain of the methods of weaving broadcloths in the French convents during the fourteenth century, this fabric would appear to be now substantially the same made four centuries ago. The only change is in the fineness of the wools used, and the perfection of the face of the goods, due to better processes of shearing and pressing. This fabric will, doubtless, always occupy the first rank among woollen tissues. In this typical product of the woollen manufacture, the broadcloths from the West of England still occupy the eminent position accorded to them in all other international exhibitions. The thickness and solidity of these cloths were not less conspicuous than their fineness and beautiful face. This was especially noticeable in the scarlet military cloths. All these cloths bear the designation of *Electoral*, signifying the kind of wool of which they are made; and, in fact, they are made of the highest-priced Silesian wool. The prices at which they were marked corresponded with their quality. The contrast of these goods with certain others made in England for export was remarkable. These fabrics are made chiefly for home consumption by the wealthy classes. Foreign competition is excluded by the national sentiment which forbids the British officer to wear any other than British cloth, and civilians are scarcely less loyal. For the class of consumers who use these

goods, the competition among the manufacturers is in excellence rather than in cheapness. But the judges had the proof within their own group, that the skill required to produce these fine cloths is not an exclusive monopoly. One of our colleagues, Mr. Lang, who commenced the manufacture of broadcloths in 1814, exhibited, though not for competition, samples of blue and black broadcloths, made in 1853, at Vassalboro', Maine. The wool was selected Silesian; costing, with duties and charges, about three dollars per pound. The cloth had 120 picks to the inch. The cloth, in fineness and perfection of finish, was admitted to surpass even the West of England broadcloths.

The comparatively low position of the United States in the manufacture of *fine* broadcloths cannot be denied. It was manifested by the absence of any notable exhibits, except by a single establishment, — the Burlington Mills, of Vermont. Their exhibits showed that our apparent inferiority in this manufacture was not due to any want of skill or capacity, but to other causes. This mill produces annually some \$300,000 in value of broadcloth; and it is known that another mill in Massachusetts, which did not exhibit, has shown equal proofs of its skill in this manufacture. The products of the mill first referred to would undoubtedly suffer in comparison with the West of England standards; for the goods, beautiful in face and fineness, were lacking in weight. But they were intentionally made to conform to the prevailing fashion of the higher standard of the German light weight goods, with which they bore a favorable comparison. It would be erroneous to make the position of the broadcloth industry a reproach against the American woollen manufacturer. The same apparent decline, though, perhaps, not in the same degree, is witnessed in most other manufacturing nations. Superfine broadcloths are now used only by a limited class; and by that class rarely, except for dress coats, which last for years. The coats are made by fashionable tailors, who, as a rule, prefer foreign cloths. As the fine cloths are principally used by the easy classes, the duties upon the fine foreign cloths are no impediment to their consumption, while the specific or

weight duty is less onerous upon them than upon common cloths

The capacity to manufacture the finest broadcloths in this country was proved many years ago, by the celebrated Middlesex Mills of Lowell, Mass., — in age, influence, and continuity of excellence, standing at the very front of our cloth mills. In ceasing to give prominence to the fine broadcloth manufacture, it has manifested no failure in skill, but simply an adaptation to the wants of the times.

The diminution in the American manufacture of fine broadcloths has been attributed to the effect of the tariff of 1846, which it is alleged was prejudicial to the woollen manufacture of that time. It certainly dates from that period. It has also been materially influenced by the constantly diminishing domestic supply of superfine wools, the Saxon wool culture, as we have seen, having nearly ceased; for it is well established that an abundant domestic supply of raw material is one of the most potent of the influences which give a special character to the manufactures of a country. But the principal cause of the decline referred to is the popular demand for other fabrics, hereafter more fully referred to. In a word, our manufacturers have ceased, as a rule, to make fine broadcloths, because they find ample and more profitable employment for their looms in the production of the lower cloths which enter into general consumption. It has been observed that a similar decline, or, more strictly speaking, diminution, of the fine-cloth manufacture is observed in other countries. Although a few excellent broadcloths and satins, or doeskins of remarkable beauty, were exhibited by Belgium and Germany, the judges of large experience in dealing with woollen fabrics failed to find in the exhibits of Belgium, and especially of Germany, that competition for excellence in the production of superfine cloths which they had been led to expect from the former reputation of Belgian and German manufacturers. In the production of plain-faced goods of a lower grade, adapted for special uses, — such as blue and gray uniforms for soldiers, police officers, news boys, and watchmen, — there were evidences

of much progress both in fabrication and cheapness on the part of American manufacturers. Our regular soldiers, wearing American fabrics, are declared by our army authorities to be better clothed than any in the world. The beauty of the uniforms of our volunteer troops, many thousands of whom were in procession on the Centennial Fourth of July, was specially noted by the foreign judges. The production of blue police cloths has become an extensive branch of our manufacture; and the cloths are marked for their cheapness, durability of dye, and solidity of fabric.

The period of 1836 was an epoch in the cloth industry of the world and of the century. It was the commencement of the change which has produced a character of the cloth fabrics, for general consumption throughout the world, which was one of the most conspicuous features of the Exposition.

In 1834, a M. Bonjean, a prominent wool manufacturer in Sedan, France, and an *élève* of the Polytechnic School, conceived the idea of modifying the plain cloths hitherto universally made, by uniting upon the same stuff different tints or patterns of tissue. This he was able to effect by the Jacquard loom. It was evident that the variety of stuffs which could be thus made was as unlimited as *fancy*. Hence he styled his woollens *fancy cassimeres*. These cloths, put on the market, and exposed at public expositions, instantly struck the popular taste, and were imitated, — at first in France, and then in all other manufacturing nations. Their introduction into this country is an illustration of the benefits flowing from National Expositions. In 1840, an American gentleman, arriving directly from Paris, visited Mr. Samuel Lawrence, then agent of the Middlesex Mills at Lowell, Mass. In the words of Mr. Lawrence, "He had an overcoat woven in diamond figures, of great beauty; said he saw it at an Exposition, at Paris; Bonjean & Son, of Sedan, were the manufacturers. He gave me a small bit from the inside of the collar." With this bit, as an example of what was to be done, Mr. Lawrence applied to Mr. George Crompton, to adapt machinery for this tissue, already devised in cotton fabrics; and the result was the invention of the Crompton loom,

upon which fancy cassimeres have since been woven, not only in this country, but in Sweden, Germany, Austria, and Belgium. From this statement, it would seem that fancy cassimeres were first made in this country at Lowell. But it should be observed that the honor of the first introduction is also claimed by the New England Mills of Rockville, Connecticut. The new cloths were adapted to the natural change which had begun to take place in the culture of wools. They required soundness, length, and strength, rather than the softness and fineness which had been the essential qualities of clothing wools. The more abundant supply of the intermediary wools has continued to favor the production of the fancy woven cloths; and from their great predominance at the Exhibition, and in the business suits commonly worn, it would seem that they comprise from three-quarters to nine-tenths of all the cloths made at the present day.

In the class of fancy woven cloths,—including not only fancy cassimeres, but cloths for over-coatings and worsted coatings,—the manufacturers of Elbeuf and Sedan sustained at the Exhibition their long-established reputation for novelty of design and perfection of fabrication; and Belgium was not far behind. The fine and thin cassimeres of Belgium, called "Batistes," made for consumption in tropical countries in the place of cotton and linen fabrics, were conspicuous for their beauty. Among the British exhibits,—besides some fancy cloths exhibited by West of England manufacturers, woven by a novel process analogous to knitting,—certain solid and substantial fancy cloths, made in Ireland of Cheviot wool, with double and twisted yarns, received special commendation, and are worthy of imitation here.

The writer may be permitted to speak of the admiration and surprise expressed by the foreign judges of this group, at the first inspection of the American fancy cassimeres. The goods of our exhibitors, it may be remarked, were arranged with good taste, in costly but not obtrusive cases, which served to enhance their favorable impression. The Swedish judge, Mr. Carl Arnberg, a practical wool manufacturer of large observation, will pardon the repetition of his precise language addressed to

the writer: "You know that the best fancy cassimeres in the world have been made at Sedan and Elbeuf in France. If these goods were placed by the side of the Elbeuf cassimeres, you could not tell one from the other, and the goods could not be bought at Elbeuf for the prices marked here." It was conceded by all the judges that our fancy cassimeres, in material, fabrication, and design, had attained the highest standard of this fabric. No single mill or State could claim the palm; for the honors were divided between a mill in Utica, New York, one in Pittsfield, Massachusetts, and three mills in Rockville, Connecticut, while other mills so nearly approached them as to make their special mention almost invidious. This favorable impression of our foreign associates was confirmed by visits which they made to some of the mills which had exhibited. They shared the opinion expressed to the writer by Professor Grothe, of Germany, author of the most complete modern treatise on the card-wool manufacture, that the American mills which he had just visited were in possession of the best and most recent processes, improvements, and machines known in Europe, and were admirable in their administration. It is due to our wool-growers to say that the cloths so highly commended were made generally of American wool; Australian wool being used in some cases, not from preference, but to eke out the short supply of the domestic stock.

It is proper in this connection to depart from the strict arrangement of the classification to consider a class of fabrics which, though made of combed wool, are really cloths, and are directly allied with the card-wool fabrics just reviewed. The Exposition showed that the most formidable rivals of the fancy cassimeres are the fabrics known as worsted coatings. Being woven in the fancy loom, either Jacquard or Crompton, and made for the same purposes and by the same manufacturers as the cassimeres, they differ from them only in the respect that the cassimeres are made of carded and the worsted cloth of combed wool. This fabric, created in France, in the introduction of its fabrication to this country affords another illustration of the benefit of International Expositions. Mr. E. R. Mudge,

of Boston, being Commissioner of the United States at the Exposition of Paris of 1867, was impressed with this fabric then exhibited, and then much worn both in London and Paris, as a novelty. Seeing that they were made of combed merino wool, he directed inquiries to ascertain if suitable wools for these fabrics could be abundantly furnished by American fleeces. Satisfying himself affirmatively upon this point, he imported and introduced the requisite machinery for combing and spinning the wools at the Washington Mills in Lawrence, Mass., of which he was a leading director. This establishment succeeded so well in the fabrication of these stuffs, and they proved so popular when thrown upon the market, that the introducer soon found a host of rivals and imitators. A new industry at once sprung up,—that of combing and spinning the wools into worsted yarns, for supplying the many fancy cassimere mills who desired to weave these fabrics. One of the most conspicuous displays at the Exhibition was that of the United Spinners' Association of Philadelphia, comprising eight distinct establishments, all exclusively devoted to making merino combing-wool worsteds for worsted coatings and for suspenders and India-rubber goods, and producing an annual product of \$1,500,000. The perfection of the yarns was fully recognized by the experts in the group of judges. They were made almost exclusively of American merino wool, which the exhibitors declared to have proved preferable for their purpose to even the best Australian wools, being "kinder, more elastic, and stronger." Here was a new industry founded scarcely six years ago, and a palpable demonstration of new and unsuspected qualities of excellence in American wools,—a demonstration most gratifying to those who twelve years ago had pointed out these qualities to incredulous manufacturers.

The American worsted coatings were extensively exhibited. The excellence attained in so short period was a matter of surprise. While the fine diagonals of Sedan were not equalled, the American exhibit as a whole compared favorably with those from abroad. In the fabrics for over-coatings, Moscows, Kerseys, Castor beavers, and Elysians, there was the same general

resemblance in the stuffs from different countries, already spoken of as forming one of the characteristic features of the woollen manufacture of the present day. All the kinds made abroad, with the exception of special novelties, — like the beautiful *peau d'ours*, a species of Moscow coating made at Dussen in Germany, and the delicately soft Montagnac over-coatings of Sedan, — are made in this country; and our own fabrics did not suffer by comparison.

The value of a national manufacture is shown less in costly fabrics than in the common cloths combining utility and cheapness. Commendation was given to a mill established as an accessory to the largest iron-making establishment in Pennsylvania, in which the women and children of the operatives obtained employment; and which furnished cloths, marked for their soundness and cheapness, for the workmen. Many of the combinations of wool with cotton or union cloths were noticeable for cheapness and utility: such as the Kentucky jeans with cotton warps and wool filling, in much esteem for cheapness and wearing qualities in the agricultural districts in the Southern and Western States. The repellants, or water-proof cloths, show another union fabric. So extensive is the demand for this material, that a single American manufacturer employs upon this fabric alone thirty-five sets and two hundred and fourteen broad looms, consuming annually a million pounds of wool.

FELTED GOODS.

The exhibits of felted goods, quite numerous and varied from the United States, were few and barely incidental from foreign nations; and those which were seen were Oriental in their origin or affinities. They were incidentally seen in the national fez of Turkey, so enduring in fabric and pleasing as well as enduring in its madder-red color, in fills of exquisite softness to the touch, made of camel's hair, forming the ground for costly Turkish embroidery (a material deserving more extensive use for this purpose), and the thick Russian felts, made up into boots and gaiters, — the only foot covering, according to Mr. Bleisky, the Commissioner of Russia, capable of resisting the

cold of a Siberian winter. These articles also deserve imitation. It is believed that felted cloth was the most natural and the first stuff employed by man. We cannot reflect without pride that the first invention of primitive man in the textile arts, originating in Asia, the cradle of the race, and still in use among the ruder tribes of the East, remained without progress for centuries, until revised, amplified, and made tributary to domestic comfort and the arts in all civilized communities, by our own countrymen and in our own times. M. Kœppelin, a French expert, speaks thus, in the *Annales du Genie Civil* of 1869, of this fabric: "In spite of the simplicity of its fabrication, and in spite of the antiquity of its origin, felting was for a long time abandoned to the lesser industries. It is only within thirty years that the mechanical fabrication of felted cloths has been essayed. Many fruitless attempts in this direction were made in France and other countries; and it is only to the spirit of invention of two Americans, Wells and Williams, that we owe the processes now in use, and which have not been materially modified since the epoch of their discovery." Their processes, he says, were applied in France and England, and are used in the latter country for making printed felt carpets, exported in vast quantities in all parts of the world, and popular from their great cheapness.

No other published notice of this interesting invention has come within the notice of the writer. He fortunately has come into possession of other facts in relation to the introduction of this important fabric, creditable alike to American ingenuity and British enterprise; which seem worthy of a detailed notice, because not hitherto known to the public. The facts are derived from a personal communication by a gentleman hereafter mentioned.

Thomas Robinson Williams, of Newport, R. I., connected with the Hazard family of that State, so well known as wool manufacturers, invented the process of making felt cloth of *commercial length*, at Rhode Island, about 1820. About 1824, he went to England, for the purpose of introducing his invention, and also one for making hat bodies, in which he was associated

with a Mr. Wells. He took out a patent in England in 1830. He succeeded in enlisting the co-operation of capitalists, who, about 1838, erected a factory in Leeds, with a capital and plant of £250,000; the designation of the proprietors being the Victoria Cloth Company. Meeting with immediate success in the fabrication, the enterprise created a great excitement in manufacturing circles, as it threatened to revolutionize the whole system of cloth making. The principal editors of the London papers visited the establishment, and vied with each other in descriptions of the new art. The Queen gave extensive orders for the stuffs; and the Mistress of the Robes — the Duchess of Sutherland — furnished the grand staircase and vestibule of her London residence with a crimson carpet of the Williams felting, draping the windows of the hall with a thinner fabric of the same make. In the full tide of its success, the vast establishment was destroyed by an incendiary fire. It was uninsured; and Williams, whose whole property was in it, died from grief and disappointment. In the mean time, a patent for making felt cloths of a commercial length, by an entirely dissimilar process, had been taken out by Joseph Waite, of Leeds; the use of which in England was enjoined by the courts as conflicting with Williams's patent. Mr. J. Burrows Hyde, of New York, our informant as to these facts, a gentleman of science and enterprise, bought both the Waite patent and the Williams patent in this country, and sold the rights to the Bay State Mills (now Washington) at Lawrence, Mass., about 1853. For many years this mill enjoyed nearly the complete monopoly of this fabrication in this country, to its great profit. The exceptions to this monopoly was a fabrication of felt cloths, not of commercial lengths, conducted in Norwalk, Connecticut, under the Bishop patent; and the manufacture of hat bodies, conducted under the Wells patents. The Williams and Waite patents having expired in Europe and this country, the manufacture has attained the wide and vast extension of the present day.

While few foreign exhibits of this fabric were noted, the American felts appeared in innumerable forms. They appeared as printed and embossed piano-cloths, ladies' skirts; as floor-

cloths printed by a Philadelphia establishment, with highly artistic designs; as a material for sheathing roofs, vessels, and iron buildings; combined with asbestos, as non-conducting envelopes for steam boilers and hot-air pipes; for lining rubber fabrics (being the only material which stretches equally in all directions); in soles for shoes, in gun-wads, in masses of several inches in thickness; for polishing wheels and buffers for jewellers; in other forms, for polishing cabinet work and marble; and, in a high-cost material, for hammers of piano-keys. Conspicuous among these exhibits were the felts for polishing, made by Charles N. Bacon, of Winchester, Mass., which possessed a thickness, compactness, and adaptation to special purposes which has never been surpassed. In the common felts, the raw material is hair, or the cheapest Mexican wool; and in the others, as before said, the finest wool from Silesia. These were interesting illustrations of the almost infinite uses which may be derived from a single attribute of a fibre; all resulting from the serratures in the filament of wool and hair, which give them their felting power.

Allied to these goods, though not strictly felts, are the felt-ings used in paper-making, which are woven fabrics highly felted. The enormous extension of our paper manufacture has of late years stimulated a supply of this indispensable material for paper-making (not long since obtained abroad) from domestic sources. Exhibits of paper felts were made by several mills. A letter from Messrs. Rice, Kendall, & Co., paper manufacturers and dealers in paper-makers' supplies, — the head of the firm being the present Governor of Massachusetts, — expresses the general character of the American felts, although having in view the product of a special mill: "We have introduced them," they say, "into paper mills making all the finer qualities of bond or writing paper; also, best and ordinary book, news, manilla, tissue, straw, and sheathing paper; also, printers' and woollen manufacturers' press-boards, leathers, and binders' boards, and wood pulp; and have had many high recommendations from the manufacturers regarding their wear and suitable quality . . . We feel confident that they (the American felt

makers named) are able to manufacture any thing in the line of feltings used by the various manufacturers of paper; and, judging from our former experience as importers of felts, they have made many improvements in them." It is curious that the art of joining the two extremities to make an endless felt is kept a secret by the fortunate possessors, for the use of which manufacturers pay a royalty.

Hat Bodies. — Although no hat bodies — another form of felted goods — were exhibited, several special machines for forming hat bodies were shown; illustrating how completely the handicraft had been substituted by machinery. There is hardly a process in the manufacture which is not now done automatically; a single establishment turning off eight hundred dozen of hats daily. The hatter, as a separate artisan, has disappeared. Fifty years ago there was one in every village. A hatter's bow having been recently required in a patent trial, a diligent search could not find one in the country.

CLASS 236. — *Plain Flannels, Dometts, Opera and Fancy.*

The flannel manufacture, almost exclusively represented at the Exposition by American exhibits, has attained an enormous development in the United States; as illustrated by the fact that an auction sale, in July last, by a single house representing 157 sets in different mills, netted \$2,500,000. Flannel being the first stage in the manufacture of plain cloth, it constitutes one of the principal products of the smaller mills in the new States; while, in the older manufacturing States, mills employing from ten to fifty sets are exclusively engaged in its manufacture. The great domestic demand for these goods may be attributed to the rigor of our climate, or to the fact that the masses of our population are liberal in providing themselves with the fabric so essential for personal comfort. Flannels find their consumption not only in men's garments, — for which purpose their use has vastly increased through better hygienic knowledge, — but in garments for children, linings for over-

coats, blouses for workmen, fatigue uniforms for soldiers and police officers, and coats for summer wear.

It is some twenty or thirty years since the American fabric has excluded foreign flannels from our market, with a single exception, that of opera flannels, which no longer exists. The primary cause of the success in this manufacture has been the peculiar adaptation of American wools for this fabric. This adaptation consists in their spinning qualities, their soundness and elasticity, and the medium fineness, producing the requisite softness, without too much felting quality to cause an undue shrinking of the goods.

By an examination of a line or series of samples of different grades of English flannels, in comparison with a line of American flannels corresponding in grade and price, it was observed that the English flannels are more highly fulled, and less finished in the face, than the American goods. The American fabrics have the yarns more closely twisted, in order to prevent shrinkage, and the fabric is smoother and more sightly in face. The difference in intrinsic value could not be proven, the different styles being adapted to the tastes of different markets. The correspondence in prices is so close that the export of American flannels to England has been seriously contemplated. A large exportation is now being made to Canada.

With the command of their own markets, American manufacturers have adapted their fabrics to the wants of consumers. In 1835, the domett flannels, an original fabric composed of a cotton warp with a filling of wool, came into use as a substitute for the linsey-woollen stuffs, originally of household manufacture, worn by working women for under-petticoats. Having the merit of shrinking but little in washing, it still holds its place as a characteristic American fabric. The red flannels have found a vast consumption in the working population, especially lumbermen and frontiersmen; the pliability of the fabric giving freedom to the limbs. Formerly the red color, less brilliant than now used, was given by a madder dye; subsequently by *lac*; while at present the brilliant and fast scarlet of the cochineal is in almost universal use, the price of cochineal

having, singularly enough, been reduced to half of its former rate by the introduction of the aniline dyes. The consumption of blue flannels by the army and navy forms another important outlet for this class of fabrics. They form the under-garments for all the men in both services, and the summer undress coats in the former. The regulations of the services require that these flannels should have a twilled weave, and be both wool and indigo dyed. The regulations of the government have tended to keep alive the skill in indigo dyeing, which, from its costliness, threatened to disappear before cheaper processes. The excellence attained in the army and navy flannels led the way to a more perfected fabric. About 1859 appeared, either through the Middlesex or Washington Mills, — for the honor is claimed by both, and the products of both vie with each other in celebrity, — the blue flannel coating, indigo and wool dyed and having a three-leaved twill. This fabric — sheared and finished like cloth, but retaining the lightness and pliability of the flannel texture, forming an admirable material for summer garments — is distinctly American in origin and character. It has a large domestic consumption, and has become an article of export to South America.

Opera flannels — a name given abroad, from one of its original uses, to a light flannel more highly gigged and finished than the ordinary article, being piece-dyed uniformly, in many fancy colors, and hot pressed — were first introduced into this country by the Bay State Mills. They have, however, gained their command of the American market, principally through the fabrication of a manufacturer of Ware, Mass., now deceased. He commenced the manufacture in 1858, making in that year four thousand pieces. In 1871, his establishment made and sold of this single fabric one hundred and twenty thousand pieces, or nearly two million yards. At this time foreign importations of this fabric has entirely ceased. The thorough cleansing of the fabric to receive the dye, and the requisite skill to give the numerous colors and shades desired, are the principal difficulties which the manufacturers have to encounter; single manufacturers keeping all the time a hundred or more distinct shades

and colors in stock. The American operas were abundantly and tastefully displayed at the Exposition by several mills. Nothing surpassed them in variety and perfection of hues and shades, except, perhaps, the masterpieces of the French dye-houses, — the exquisite merinos of Rheims and Paris.

It is noteworthy that these fabrics are made wholly of American wool; the quality known as XX being used for the medium, and picklock (selected from choice flocks) for the finest, grades; manufacturers who have tried Australian wools, and abandoned them, asserting that a softer fabric is made from domestic wools.

American flannels of a still higher grade exhibited were the all-wool gauze and silk-warped flannels. The credit of the introduction of the fine-flannel manufacture belongs to the Ballardvale Mills in Andover, Mass.; this mill being the first which made fine yarns by double spinning. In some of these fabrics, made expressly for the Exhibition, there were 130 picks to the inch. The yarns for filling were spun in such fineness that they attained 46,500,000 yards in length to the pound, the warps reaching 34,500 yards. Among the uses of these fine flannels is their application for lining coffins, and for burial shrouds. It is known that the wealthy classes in England, in the last century, rebelled against the English law requiring all persons to be buried in flannels. It is curious that improvements in manufacture have caused a fabric, which was then obnoxious from its coarseness, to be now specially adapted for burial habiliments, through its softness and fineness.

Another variety of flannel, which has wholly replaced the French fabric formerly largely imported, is the fancy flannel still called French plaid. The fabrics of this variety consist of plaids, or broken plaids and checks, and are dyed in the wool. The great bulk consists in two colors combined, — scarlet and white, and blue and white. They are largely used for shirts and children's garments. The printed flannels for children, formerly in use, have almost wholly disappeared.

Of the whole of the class of fabrics now under consideration, of so much importance to the comfort and health of the commu-

nity, it may be said that the American fabrication completely supplies our domestic wants.

CLASS 237.— *Blankets, Robes, and Shawls.*

The last observation made under the preceding class also applies to the first article in this class. The American medium or grade merino wools are no less fitted for flannels than blankets. They compose the raw material of the great bulk of the blankets which enter into our consumption, although noils from carpet and combing-wools are used to some extent. The lowest grades of blankets, composed of shoddy, hair, and the cheapest wool, which are salable abroad, cannot be disposed of here. Even the lowest of our consumers, the savage Indians,—who are supplied with blankets by our government, according to the statement of one of the colleagues, who is also a member of the Board of the Indian Peace Commission,—are skilful judges of the quality of blankets. The standard Indian blankets shown at the Exhibition exhibited all the requisites of a substantial and useful article.

Many mills are exclusively devoted to the production of blankets, principally those of medium qualities for the consumption of the millions. Some Eastern manufacturers, who have made blankets for forty years, have a yearly production exceeding \$1,000,000 in value; and one establishment in Minnesota, a production of nearly \$400,000 annually. The substantial quality of these medium goods, and in some, the cleanliness of the stock and freedom from grease, were especially noticeable.

No wool fabrics at the Exhibition, of our own production, attracted so much admiration from the foreign judges as the highest grades of American blankets. The credit of the introduction of this eminently characteristic fabric is due to the Mission Mills of California, established in 1858. Nothing comparable with these blankets, in weight, thickness, softness, and perfection of face, had ever before been attempted; and it is

impossible to conceive of a more luxurious bed-covering. The beauty of the fabric was not less a matter of surprise to our foreign visitors than the luxurious tastes of a people which could make blankets costing from thirty to fifty dollars a pair salable. The California blankets of this grade are made with a filling of Australian wool, the warps being of California wool. Blankets of no less beauty and perfection were exhibited by a Minnesota mill, and these were made exclusively of wool grown in that State.

Totally different in style and material, but not less admirable, were blankets exhibited by Austria and the Netherlands. Those exhibited by a Netherlands manufacturer were especially noticeable. The wool was of a coarser quality than that used in the California blankets, and the pile of unusual length. They were woven in great variety of colors, and with tasteful designs, in the Jacquard loom; and are highly worthy of imitation by our manufacturers.

An ample field for the application of color is found in the manufacture of rail-car blankets, and especially of carriage, railway, and lap robes. All the European styles of these articles have been adopted here, besides other articles of this class of still more extensive use, such as the admirable horse-cloths and blankets not long since exclusively furnished by England, which find complete imitation, if not improvement, in our own manufactures.

In the important class of *shawls*, we naturally observe those most nearly allied in material and texture to the fabrics which we have been considering. The manufacture of the all-wool plaid shawls—formerly known in this country as the *Bay State Shawl*, from the mill which introduced it—originated in Massachusetts about 1848. Favored by the easy application of the cassimere twill to this fabric, and the facility with which the design is made and varied through the alternate concurrence of the warp and woof, and still further aided by the adaptation of medium American wools to this fabric, it at once attained perfection. The shawls of the Bay State Mills exhibited at the first International Exposition, that of 1852, were pronounced

by French experts as "quite remarkable for the lightness and softness of the stuff;" and shawls exhibited by the same mill at the Paris Exposition of 1867 were commended for the same qualities, as well as for their moderate price. This manufacture has now immense production, quite excluding foreign articles of the same grade. Still, the English and Scotch shawls, made of coarser Cheviot wools, and of a thicker texture, would be preferred for many uses.

No attempts to make the highest qualities of shawls have been made in this country, partly for the same reason that the French, who had perfectly succeeded in making the cashmere shawls, were compelled to abandon the manufacture, because the French ladies preferred an inferior but genuine Indian shawl to a better article of French fabrication. Exquisite shawls, but of precisely the same texture as the Indian shawls, were exhibited by Lyons manufacturers. The material is the finest and costliest electoral wool. The prices range from thirty to one hundred and fifty dollars. The only rivals of the French in this class of shawls are houses in Vienna, whose products were also exhibited. None but the initiated could determine the difference between these two national products. The French, however, assert that the Austrian products are copied from their own, but that the delicacy of the originals is lost; saying, "One may transplant a tree, but not the soil and the air which gives flavor to its fruits." It is asserted that the silky Mauchamp wool referred to in Part I. forms a material for the finest shawls really surpassing the cashmere of the East.

Admirable shawls made of wool or worsted, in India designs, have become celebrated under the name of Paisley shawls, from the place of their manufacture in Scotland. None of the Scotch shawls of this class were exhibited. But this style of fabrication was represented by shawls, of India designs, made by Messrs. Martin Landenburger's Sons, of Philadelphia, the material being American combing wool. These shawls, well made and in excellent taste, are woven in the power Jacquard loom, at prices so moderate as to insure a large popular consumption.

CLASS 238. — *Combed Wool Fabrics, Worsted, Yarns, Dress Goods for Women's Wear. Delaines, Serges, Poplins, Merinos.*

This class includes, with the exception of carpets, all the multitudinous fabrics recognized in England as the products of the worsted industry. It forms the second of the two grand divisions of the wool industry. Through the variety of its products, the skill demanded in their fabrication, the capital and number of persons employed in the great manufacturing nations of Europe, and the rapidity of its development during the last century, this division has become the most important branch of the woollen manufacture. Less important in this country, it is not less interesting as opening the richest field for new industrial victories.

So important a class could not fail to be largely represented in an exhibition of the products of the world; but the student of textile industry was obliged to regret an incompleteness in the series of these fabrics, especially from the two leading nations in this industry, — France and England, — and a deficiency in the labelling of many which were exhibited, so as to show their proper names and composition. We were disappointed in the expectation that the exposition would shed full light upon the difficult subject of the nomenclature and composition of the infinite variety of worsted fabrics. We use the word "worsted," — which, although not strictly accurate, is the most convenient English term — to designate the fabrics in question.

To render our future remarks intelligible to unskilled readers, we are compelled to enter at once upon the subject of the names and distinguishing characteristics of worsted fabrics; an inquiry demanded by the popular ignorance on the subject, which prevails to no little extent even among the dealers in the articles in question. In no department of practical knowledge is there so much confusion in the meaning and application of names. The names of the fabrics have rarely any etymological signification. They are usually given arbitrarily by the first introducer of the article; and, if they are successful, become

applied to articles quite different from the original fabrics, and especially to imitations in cheaper materials. Fabrics substantially the same are constantly reappearing under different names. It is still possible, though difficult, to obtain some order out of this apparent confusion, and to bring the different varieties of these fabrics into an arrangement which approaches a scientific classification.

The leading basis of this classification is the character of the weave, or, as it is styled by the French, the *armure* of the fabric; the word *armure* signifying the system of harnesses with which the loom is *armed*, or provided, to produce a definite tissue. These *armures* consist of four fundamental or classical forms, from which all the varieties of simple tissues are derived;

1. That of *taffeta*. In this, the most simple form of tissue, there are only two harnesses, forming a simple interlacement of the threads of the warp and weft. This is the weave of broad-cloth, cotton shirtings and sheetings, and mousselines de laine.
2. The twilled or *Batavia* weave, produced by four harnesses.
3. The *serge* tissue produced by three harnesses.
4. The *satén* weave, produced by five or more harnesses, the effect of which is to bring the threads of the weft to the face. Different effects are produced from derivatives of these fundamental tissues. Thus, in the most simple, — that of cloth or taffetas, — varied effects are produced by the greater or less torsion of the threads, and the direction in which they are twisted; by variations in the size of the threads of the warp or weft compared with each other; by making the same weft pass alternately over two threads and one thread of the warp, making a "rep" or corded tissue. Still other variations are made by the different materials of the warp and weft, by having them of pure wool and of a single color, or mixed with silk, mohair, or China grass, or by having the threads printed in different tints. The four fundamental regular interlacements before described, which form the base or ground of even the most complicated tissues, are further varied by having combinations of crossings of the threads which occur at variable places at each course of the thread across the web, forming figured, brocade, or damasked effects, which are pro-

duced by the Jacquard loom. Another variation is made by having two warps; one to form the ground of the tissue, and the other made to pass over wires to form a loop, making the velvet or pile fabrics. There are still to be added the highly important differences of character, equally obvious to the touch and the eye, produced by the character of wool used; whether fine and soft (like merino and cashmere), or hard and lustrous (like English combing wool and mohair).

These remarks will enable the reader more readily to understand the classification of fabrics condensed from M. Alcan (the highest authority upon this subject), and published in his treatise on working wools, in 1866. As the American importation of worsted dress goods is principally from France, the catalogue is not less valuable because limited to French fabrics. For the same reason, the French names are retained.

WORSTED STUFFS OF FINE WOOL.

NAMES OF STUFFS.	ARMURE.	WARP.	WEFT.	QUANTIFICATIONS.
Manteau	Taffetas	Wool carded	Wool carded	{ Made of long combed wool, and with for furniture.
Reps	do.	Wool	Fine wool	
Turquoise	Serge	do.	Wool	
Merinos	Batavia or twill on both sides.	Fine wool	do.	{ Woven in checks and Scotch plaids, the warp having a serge armure of 3 and 1, and the weft a serge armure of 1 and 3.
Cashmere	Twilled on one side	do.	do.	
Drap d'été	do.	do.	do.	
Mouselines	Taffeta	do.	do.	{ Made from 8 to 20 picks to the centimetre. It is universal. Ponce dyed.
Mouletons	Satin	Wool	do.	
Popeline or Poplin		Various materials.	English wool	
Barège	Gauze or open Taffeta	Cotton	do.	{ The warp double.
Challis	do.	Silk grège	Merino wool	
Grenadine	do.	Silk grège, organzine, or cotton	English combed wool	
Mozambique	Gauze and Taffeta	Cotton	do.	{ Poplins are either all wool, or with warps of cotton, silk chappe, or organzine, or fancy printed. The poplin or corded effect produced by the size of the weft.
Crape of Spain	do.	Silk grège	Merino wool	
Llano	do.	Cotton	Mohair, or mixed with silk	
				Generally printed.
				Differs from barège only in the materials.
				{ The weft highly twisted and gas serged ; a kind of close barège.
				{ The same weave as the preceding, but differing in material.
				{ The warp composed of three threads, and is white, while the weft is violet blue, or black, which gives reflections to the stuff.

NAMES OF STUFFS.	ARMURE.	WARP.	WEFT.	OBSERVATIONS.
Grisaille	Taffeta	Cotton chappe, or fancy	English	The warps are printed or <i>chinés</i> .
Toile de Saxe	do.	Cotton, simple, or double and twisted	do.	Characterized by its peculiar finish.
Circassienne	do.	Silk grège	Mohair, or silk and mohair	{ The stuff has a peculiar elasticity, due to the close spinning of the warp.
Cretonne	do.	Cotton, double and twisted	Wool	
Japons	do.	Simple cotton	Carded wool	
Vode	do.	Wool	Combed wool	For religious uses.
Valencias	do.	Silk chappe	Wool	For furniture.
Damask	Figured or fancy	Wool or silk	do.	{ A light flannel, made in gray or in all varieties of colors.
Bolivar	Taffeta	Wool	do.	
Alpaga	do.	Cotton	Lincoln wool	
Popeline Satin	do.	Wool and silk grège	Knit wool	
Taffetas	do.	Silk	Merino wool	
Biarets	Corded or cannel	Merino wool	do.	
Épinglé	Taffeta and corded	do.	do.	
Alpine	Serge 2 and 1	Silk	do.	
Drap d'Alpes	Serge	Fancy	do.	
Anacosti	do.	Wool	do.	
Batavia	do.	do.	do.	
Epengline	do.	Silk	do.	
Tamisé Reps	Corded	Wool	do.	
Veloutine	do.	Fancy	do.	
Drap d'Alma	do.	Wool	do.	

There are no means of obtaining the names of other French fabrics, or the new names of the same fabrics introduced since the above list was published, except from the dealers in these articles. We have to thank Messrs. Hovey & Co., of Boston, for a series of samples of French fabrics, with the following names : —

Velours	All wool.
Empress	All wool.
Chambery Gauze	Silk and goats' hair.
Mousseline de Bege	
Cashmere de Bege	All wool.
Merino Tullé	All wool.
Pongee	Silk and wool.
Mohair Glacé	Goats' hair and cotton.
Vigogne	Silk and wool and all wool.
Serge	All wool.
Basket	All wool, fancy.
Matelasse	Silk and wool.
Diagonals	All wool and silk and wool.
Imperial Silk Serge	Silk and wool.
Algerine	All wool.
Armure	Silk and wool.
Turenne Cloth	Cotton and wool.
Drap d'Alma	Silk and wool.
Sicilienne	Silk and wool.
Bombazine	Silk and wool.
Tamise	All wool.
Chinchilla	Camel's hair.
Mexican Cloth	Silk and wool.
Knickerbockers	{ Wool with irregular spots of different colors and materials.
French Camel's Hair	
Satine	Cashmere goat's wool.
Australian Crape	All wool, with satin weave.
Drap de Nationelle	Cotton and wool.
Parametta Cloth	All wool.
Henrietta Cloth	Silk and wool.
Hernani	Silk and wool.
Damasks	{ Wool, silk and wool, and wool and cotton, in infinite varieties for furniture woven on the Jacquard loom.
Brocades	

Some of the general features of the French fabrication of dress and furniture stuffs may here be appropriately considered. The influence of the possession by France of merino wool upon

the character of her dress fabrics has already been referred to in the first part of this report. In the spinning of fine merino wools, and weaving them into dress goods, France takes precedence of all nations.

The most important contribution to this success was the invention, by Heilman of Mulhouse, of a method of mechanical combing adapted to the short fibres of merino wool, as well as to the long staple formerly regarded as exclusively combing wool. Mainly through this invention, France, to use Mr. Alcan's words, "marched, in the early part of this century, with the step of a giant. The means of fabrication were so ameliorated, in the short space of a quarter of a century, that the spinning of merino wools attained a fineness and regularity once impossible with the best hand spinning. The machines turned out lengths of yarn of 200,000 metres to the kilogramme, from a kind of wool which, twenty-five years before, would scarcely have produced 50,000 metres; and the price of the unit of weight of an identical article had descended from eighty to fourteen francs, although the prices of labor had increased." Among the exhibits of the house of Auguste Seydoux, illustrating the material from which their famous merinos and cashmeres and challis are made, were worst yarns of Australian combed wool of the fineness of 109,120 yards to one pound. It is unnecessary to enlarge upon the beauty and perfection of the merinos, cashmeres d'Écosse, and challis exhibited at Philadelphia. They are recognized throughout the world as inimitable, and as exhibiting the most perfect fabrics in the whole range of the textile industry.

Another reason for the French success in these fabrics, is the specialization of different branches, the fabrication of the same article; the spinning, weaving, and finishing forming the three great groups. This division of the fabrication into groups, according to Alcan, "facilitates the labor, concentrates the aptitudes, regulates the production, and contributes to ameliorate the results and the economical conditions. Specialization renders the industry accessible to all,—to moderate fortunes as well as heavy capital." The adoption of this system is now taking place in

Philadelphia, with marked beneficial results. Another cause must always give France the pre-eminence. The *arbiter elegantium* of the world in the fabrics of taste, she can impose, by her imperial sway, the fabrics which she has created, upon the followers of fashion throughout the world, leaving the other nations to supply imitations to the less fastidious masses.

England, who did not do justice to herself by her display of worsted fabrics at Philadelphia, — the exhibits from Bradford, the chief seat of her worsted fabrication, being hardly worthy of mention, — has attained success in another direction. She aims to supply the world with worsted fabrics adapted for the consumption of the million. In extent of production and cheapness of fabrication, she leads all other nations. It would be presumptuous to attempt, in the space allotted to this paper, even a sketch of her vast worsted manufacture; while its characteristics, and the names of its principal fabrics, can be intimated at least, under the head of our own worsted manufacture, which is in the main copied from that of England. A feature of some of the higher class of her worsted fabrics displayed at the exhibition should not be passed without notice. With fashions at present prevailing, there is an extremely limited application of the arts of design in fabrics destined for personal wear. Even the printing of dress goods of wool and mixed materials, which offered a wide field for the application of art, has greatly declined; as the costumes of the present day obtain variety by the use of different hues of plain fabrics. An ample field for the application of art is found in stuffs for furniture, carpets, and hangings for rooms, — the furniture and curtain stuffs of worsted, or worsted and silk. The reps, damasks, and brocades showed the wonderful artistic progress effected by her schools of design and her teachers in practical art; such as Jones, Hulme, Morris, and Dresser. The displays of the Royal School of Art needlework showed that the highest amateur taste of the kingdom is being brought into the service of the decorative arts, furnishing models and stimulus to the practical manufacturers. Through these influences, the designs for decorative fabrics have a style distinctly recognized as that of the "English school,"

in which mediæval motives are revived, plant-forms are conventionalized, while the natural treatment of foliage and flowers, and the artificial luxuriance of the *Renaissance* designs, are equally abjured. In the decoration of furniture stuffs of their own style, the English are without rivals.

Before proceeding to a sketch of the worsted manufacture of the United States, which we shall give from purely original inquiries, it will be proper to refer to one of the most important steps in the progress of the worsted manufacture in this country, to which our own industry owes its importance. All wool mousselines de laine were perfected in France in 1831. In 1833, a fabric first appeared in France which was a copy of the wool mousselines, with the difference that the warps were made of cotton. The English adopted this manufacture, at Bradford, in 1834–35. No event of the century has done more for female comfort and for the industry of wool than the introduction of the cotton warp. Cotton, instead of being the rival, became the most important auxiliary, of wool, and has added vastly to its consumption. The *generic* name of cotton de-laines, although now but little used, may be conveniently retained to express the whole class of these fabrics. They are practically the same as a woollen fabric, being so covered with wool that the presence of cotton can be observed only by the closest inspection. Their cheapness and durability make their introduction an invaluable boon to women of moderate means. Their fabrication constitutes the chief feature of the manufacture of the great cities of Bradford in England, and Roubaix in France.

THE PRINCIPAL COTTON WARPED, WORSTED FABRICS MADE IN BRADFORD AND THE UNITED STATES.

NAMES.	WEAVE.	WEFT.	WARP.	OBSERVATIONS.
Delaines	Taffeta	Medium wool	Cotton	Printed.
Barège	Gauze	do.	do.	A gauze weave.
Reps	Double threaded Taffeta	do.	do.	Printed.
Cashmeres*	Twilled	XX Merino wool	do.	Made in imitation of Cashmeres d'Écosse, all wool.
Alpaca†	Taffeta	Long-lustre wool	do.	Went originally made of alpaca.
Brilliantine	do.	Fine mohair	do.	Usually black, the warps dyed before weaving.
Lustres	do.	An alpaca of lower grade	do.	
Fancy Alpaca	do.	Figured fancy weave	do.	
Brocade	do.	A corded ground with a figure.	do.	
Poplin	do.	Long-combing wool	do.	
Delaiqe	do.	A fabric with weft of black and white wool mixed		A corded effect produced by the size of the warp.
Melange	do	The same plain	do.	
Italian Cloths	Twilled	Long-combing wool	do.	

* Called "Coburg" in England.

† Same fabrics originally called in England "Orléans."

The first attempt to fabricate delaines in the United States was made in a mill at Ballardvale, in the town of Andover and State of Massachusetts, about 1844, by John Marland, agent of the company. It is worthy of note as illustrating (what will hereafter be more conspicuous) how naturally and by direct descent the new industry arose and spread, that the mill at Ballardvale had been organized to make fine flannels, being first to fabricate flannels in the country. The transition was natural to delaines; which, as first made, had much of a flannel character. About 1844, this establishment imported worsted machinery from England, and made some delaines for printing and others for dyeing. They also introduced hand-combers, and made their own warps. The wools for the printed delaines were all combed by hand. The goods were first printed by blocks at North Andover, and afterwards on the machines of the Hamilton Manufacturing Company, at Lowell. The fabrication was very successful, although the goods were inferior to those now made. The principal difficulty encountered was that of introducing the fabrics into the American market; which was accomplished only by simulating foreign marks and disguising the boxes, to conceal the domestic source. This mill was subsequently leased to Mr. Jeremiah S. Young, who successfully continued the worsted manufacture.

The success at Ballardvale induced one of the oldest of the cotton manufacturing establishments — the Amoskeag Company, at Manchester, N. H., — to try the new fabric. A mill owned by this company at Hookset, in New Hampshire, was devoted to an experimental trial; and Mr. Marland received an interest for conducting the manufacture, which was commenced with about 200 looms. The goods were printed at Greenwich, in Rhode Island. The fabrication was continued at Hookset for six or seven years, with a product of about 38,000 yards per week. The goods sold in the gray at about 94 cents per yard; wool sorts, which now cost 60 cents, costing but 36 cents, and cotton about 10 cents, per pound.

About 1845, certain of the stockholders of the Amoskeag Company organized the company now known as the Manches-

ter Mills, situated in the town of that name, purchased a site and power from the Amoskeag Company, and built an extensive factory expressly for the purpose of making delaines. The cotton warps were originally made at Hookset. The first delaines were made at Manchester by carding; the wool-combers not being introduced until 1855, the Noble comber finally taking the place of the inferior combers of American invention first used. This company continued to improve its machinery and enlarge its production, which now reaches 250,000 pieces annually, of fifty yards each, the products having a reputation equal to that of any in the market.

The Hamilton Woollen Company, at Southbridge, Mass., was originally established for the manufacture of cloths. About 1845, the leading stockholders of this company, who had been selling agents of the Amoskeag Company, seeing the success at Hookset, resolved upon converting the mill at Southbridge into a worsted factory. It met at first with little success, until its management was undertaken by Mr. Ballard, in 1846, who is still the treasurer of the company. The products of this mill in printed delaines and reps received deserved commendation at the Exposition.

The line of descent in our worsted manufacture, which we have traced from the establishment at Ballardvale, was continued in the Pacific Mills, its first treasurer and the constructor of its works being Mr. Young, before referred to, a brother-in-law of Mr. Marland, who had gained his practical experience at Ballardvale.

As this establishment is the largest in this country, and, as it is believed, in the world, where all the branches of the worsted fabrication are carried on within the walls of a single proprietorship, its exceptional importance will justify a somewhat extended notice of its history and operations.

The Pacific Mills are situated in Lawrence, Mass., on the Merrimac River, twenty-six miles from Boston. The enterprise was started by the Essex Company, Mr. Abbott Lawrence being President and Mr. Young Treasurer of the company. It was incorporated in 1853, under its present name, with a capital

of two million dollars, for the purpose of making ladies' dress goods from wool wholly, from cotton wholly, and from wool and cotton combined; and was provided with all the appliances of manufacture, including print and dye works. The construction of the works having exceeded the amount of capital paid in, the establishment found itself, in the very first years of its existence, on the brink of failure. This failure was arrested by the munificence of Mr. Abbott Lawrence, who, on his private responsibility, advanced several hundred thousand dollars to meet the emergencies of the mill; thus adding to his title for recognition as one of the great founders of the manufactures of New England. A hardly less important work of Mr. Lawrence was the securing for the treasurership of the mills, vacated through the declining health of Mr. Young, of the services of Mr. J. Wiley Edmands, who had been educated in his house. Mr. Edmands took the treasurership and the responsible management of the mills in June, 1855. For the subsequent two or three years, the establishment, although actually making money, was only sustained by largely borrowing moneys. In 1857, the leading commission houses of New England succumbed under the pressure of the well-known panic of that period. The Pacific Mills were compelled to ask an extension of credit for six months, to which every creditor assented. In 1858, the stockholders were called upon to furnish an additional capital of \$500,000, of which all but \$75,000 was secured. The stock representing this amount, not secured, was sold at public auction, in 1859, from \$1,320 to \$1,312 per share, the par value being \$1,000; although, in 1857, two years previously, many shares had been sold at prices ranging from \$75 to \$200. During the first year of the war, 1861, the mills lost money; its product then being about 11,000,000 yards of dress goods, cotton and woollen. In 1870, the product reached 45,000,000 yards; and, for several years since that date, the annual sales, including the cloths purchased for printing, have reached about 65,000,000 yards. Of this, about sixty per cent are stuff or worsted goods. Estimating our population at 45,000,000, and that one-third of this population (15,000,000) consists of women and girls, the Pacific Mills, which have all their

consumption at home, supply not less than four yards of dress goods to each person of our population wearing these fabrics.

The following statistics of this establishment will give a better idea of the magnitude of its operations : —

Number of mills and buildings	12
Acres of flooring in buildings	41
Cotton spindles	135,000
Worsted spindles	25,000
Number of looms	4,500
Pounds cotton used per week	116,000
Pounds fleece wool used per week	65,000
Yards of cloth printed or dyed per week, more than . .	1,000,000
Printing-machines, — from two to sixteen colors . . .	24
Tons of coal used per year	23,000
Number of steam boilers in all (32,000 horse-power) . .	50
Number of steam-engines (1,200 horse-power)	87
Number of turbine wheels (2,000 horse-power)	11
Cost of gas per year (5,000 burners)	\$35,000
Cost of labor per month.	\$160,000
Average daily earnings, women and girls	96 cents.
Average daily earnings, men and boys	\$1.40
Persons employed, women and girls, 3,534 }	5,300
Persons employed, men and boys, 1,766 }	
Number of houses for work-people	275

To this it may be added, that the raw materials for dyeing and printing require an annual expenditure of \$400,000; the consumption of potato starch is 500 tons a year, or the product of 125,000 bushels of potatoes; the wool consumed requires the fleeces of 10,000 sheep each week; while to all these is to be added the food and clothing of 5,300 operatives, and their dependants (at least twice as many more), and the items of transportation of raw material and manufactured products. Considering these multiform relations, how vast is the wave of production set in motion by the wheels of a single factory, and how broadly extended are its ever-enlarging circles! for the materials of consumption above enumerated show that the productive stimulus of this industrial centre moves labor, not only in the fields of the South and the pastures of the West, but on the plains of India, the forests of Brazil, and the islands of the equator.

The extraordinary success of this establishment, although favored by the circumstances of the times, is to be attributed mainly to its command of the almost unequalled facilities of administration possessed by its Treasurer, Hon. J. Wiley Edmands, now deceased, and to its fortune in having a selling agent, Mr. James L. Little, whose mercantile sagacity was supplemented by a creative taste, which he imparted to all the fabrics of the mill. Not less conducive to its success was the enlightened regard to the higher social obligations in industrial enterprise which distinguished the earlier founders of the New England manufactures.

The company has never ceased its care for the welfare of its operatives, and their improvement morally and intellectually. It early founded a library, with reading-rooms, which contains nearly 7,000 volumes, and which is open to the work-people and their families, and has actually an average of 700 daily readers. It has established a relief society for work-people temporarily ill, to which the operatives and the company contribute; as well as a "Home," or hospital, provided with physicians and matrons, where those seriously ill can be better provided for than in the boarding-houses of the company, or even in their own homes. As the result of this recognition by the company of its moral responsibilities, there has been no disposition on the part of its operatives to organize strikes; all difficulties which have arisen having been amicably arranged. This moral work of the company was suitably recognized at the Paris Exposition of 1867, by the tribute to the company of one of the ten awards granted, from five hundred contestants, to the individuals or associations "who in a series of years had accomplished the most to secure harmony between employers and their work-people, and most successfully advanced their material, intellectual, and moral welfare."

This mill has been selected as illustrative of our highest achievements in the department to which it belongs. We would by no means have it inferred that its products are superior to those of mills of less magnitude. The Manchester Mills, with an annual product of dress goods of 250,000 pieces of 50 yards

each ; the Hamilton Woollen Company, with a product of 800,000 pieces ; the Washington Mills, with a product of 2,000,000 pieces, — each, manufacture worsted fabrics of no less excellence. It is due to the latter establishment to say, that it was the first in this country to manufacture certain all-wool dress fabrics formerly obtained exclusively from France. Some of these fabrics which it was the first to introduce, such as the all-wool matelasses, are made not only by this establishment, but by Messrs. Martin Landenburger & Co., and Thomas Dolan & Co., of Philadelphia, and have high repute in our markets.

A very important class of dress fabrics was not undertaken in this country until 1872, — that of black alpacas, mohairs, and brilliantines. It was, not long since, believed that these goods could not be successfully made elsewhere than in Bradford, England. The Arlington Mills, of Lawrence, Mass., were the first in this country to overcome the difficulties of this fabrication, and have since made a specialty of this branch of manufacture ; these goods forming a large part of their annual production of 5,000,000 yards. The black alpacas, mohairs, and brilliantines exhibited in great variety by this company, as well as by the Farr Alpaca Company, of Holyoke, were fabrics equal in all respects to the productions of the best manufacturers in the old-established seats of the worsted industry in Europe.

Reference must be made to other worsted fabrics not included in the category of dress goods.

The manufacture of lastings, which are made from long-combing wools of English blood, until recently, has been regarded as an exclusive English monopoly ; and the English lastings at the exhibition well sustained their traditional reputation. All attempts in this country failed until after 1867, when the Lowell Manufacturing Company, encouraged by the tariff of that period, first successfully achieved the fabrication of this article. They were followed by the Peacedale Manufacturing Company, of Rhode Island, and others, and at present the American shoe manufacturers are largely supplied by lastings of domestic production.

Before the late war, English bunting made, like lastings, of long-combing wools, formed the sole material for our national flags. The United States Bunting Company, of Lowell, first successfully achieved the manufacture of bunting. Its exhibits at Philadelphia showed not only excellent fabrics in bunting and moreens, but a marked improvement in the construction of the national flags. Formerly, to use the words of the chief promoter of the enterprise, General B. F. Butler, "the American national flag was made by sewing together bits of bunting; and, for stars to make the Union, seventy-two pieces of cotton cloth were sewed upon it. Now a beautiful star is colored in by press dyeing, and a much superior flag is made."

In tapestries and upholstery stuffs of worsted or worsted mixed with cotton and silk, there was but one prominent American exhibition, — that made by Messrs. Kelty & Co., of New York; but this, in tastefulness of design and excellence of fabrication, was encouraging as to our future success in this attractive department.



CLASS 239. — *Carpets, Rugs, &c.* — *Brussels, Wilton, Tapestry Brussels, and Velvets, Axminster, Venetian, Ingrain Felted Carpets, Druggets, Rugs, &c.*

Among the surroundings of our homes, there are none which bring so palpably before our eyes the arts of design of remote centuries and distant peoples as carpets. Originating in Persia at a period almost on the verge of history, and among a people of the ancient Aryan stock, among whose descendants in the centre, south, and east of that country are found the present chief seats of the textile industry of Persia, the carpet manufacture was carried from thence to India, and to Arabia and Turkey, — Persia holding in the arts the same relation to the Arabs that the Greeks did to the Romans. Carpets were introduced into Europe by the Crusades. Their manufacture in Europe was first undertaken in France, under the patronage of Henry IV.; and the manufacturing of carpets, under royal pat-

ronage, was founded at Beauvais, by Colbert, which still exists. Carpets in Europe, like china or porcelain, descended to the homes of the people from palaces; and the influence of original designs for royal establishments may still be seen in the gorgeous patterns of French carpets.

There were ample opportunities at the Exposition for studying this, the most attractive department in the whole range of the textile industry, as it is the only one in which the arts of design have still unrestricted sway, and where the value of the fabric is controlled mainly by artistic considerations. Persia, India, Turkey, France, Germany, Austria, England, Scotland, and the United States, each exhibited its characteristic fabrics, and no important national product or variety of fabric in this department was without representation. We will briefly refer to the different national products; arranging them in the order of their origin, and availing ourselves of the artistic suggestions of Redgrave, Dresser, and Major R. Murdock Smith, under the light of whose illustrations they were observed.

The carpets of Persia first claim notice, specimens of which were supplied Messrs. Sloane, of New York; our observation having been enlarged by a study of Persian carpets and rugs directly imported by them, forming a stock, in their warehouse in the city of New York, of a value exceeding one hundred thousand dollars, and making a museum of Persian art in this department not surpassed by the collection at Kensington.

The Persian carpets, or rather rugs, are made chiefly in Kurdistan, Khorassan, Feraghan, and Kerman (our principal authority for these statements being the notes on Persian art by Major R. Murdock Smith, R.E.); each district producing a distinctive kind in texture and style. The finest are those of Kurdistan. In these carpets the pattern does not represent flowers, bouquets, or other objects, thrown up in relief from a uniform ground, like so many of the inappropriate designs of Europe; but looks more like a layer of flowers strewn on the ground, or a field of wild-flowers in spring. The borders are always well marked, and usually of brighter colors than the centre.

Besides the ordinary "Kali," or pile carpet, others called "Do-ru" are made at Kurdistan. These are smooth, without pile, and alike on both sides; and are used, in travelling, for spreading upon the ground.

The carpets of Feraghan resemble those of Kurdistan in style, although the texture is looser and the pattern simpler. They are, consequently, cheaper, and in more general use. Fine Kurdistan carpets cost from £3 to £4 per square yard. The Feraghan carpets cost from 15s. to 18s.

The Khorassan carpets are somewhat superior in texture to those of Feraghan; but the patterns are usually more realistic. Kerman carpets are next in value to those of Kurdistan; but the designs are usually still more realistic than those of Khorassan. Besides flowers, figures of men and animals are not uncommon.

According to Major Smith, the carpets of every description are made without even the simplest machinery; the loom being simply a frame on which the work is stretched. The woof consists of short threads woven into the warp by the fingers, without a shuttle. When a row of the woof is thus completed, a sort of comb is inserted into the warp and pressed or hammered against the loose rows of woof yarns until they are sufficiently tightened to the rest of the web. The pile is formed by merely clipping the ends of the woof until an even surface is obtained. The weaver sits with the reversed side of the web towards him; so that he depends solely upon his memory for the formation of the pattern.

The Persian carpets are usually somewhat long and narrow, — a form adopted because more easily woven, while it is adapted to the usual narrow dimensions of the Persian houses. The space for carpets on the floor of these Persian apartments is still further narrowed by the habit of laying strips of felt at the upper end and along the sides of the room, the narrow carpet occupying the middle space. The spreading of Oriental rugs upon plain felt carpets, now somewhat in vogue, is an unconscious adoption of Persian fashions.

In an artistic point of view, the Persian carpets show an ex-

cellence so marked that the educated observer cannot have a moment's doubt as to their superiority over all other Oriental products of their class. They are distinguished by their subdued tones and the harmonies of their various colors. Complicated and mysterious in design, they are perfectly satisfactory, filling the mind with the satisfaction of repose and rest. Various as they are, there are certain forms repeated in all designs; so that the national characteristics are clearly marked to those familiar with them.

Indian carpets (some beautiful specimens of which were shown in the Exhibition) are made in large single pieces adapted for covering floors of considerable space. Those exhibited remarkably illustrated the characteristics of design pointed out by Mr. Redgrave. They had a great variety of colors; but so evenly distributed, and each so well balanced by its complementary and harmonizing hue, that the general effect is rich and agreeable. The effect at a distance was a somewhat foxy tone, in consequence of the free admission of warm neutrals; as brown and brownish purple, white and yellow, which are but sparingly introduced to define the geometrical arrangement of the forms. The forms consisted largely of highly conventionalized flowers and plant motives, all geometrically constructed. These carpets were much more agreeable in tone than the real Turkey carpets at present so much in vogue.

The Turkish or Smyrna carpets, which were well illustrated, in the best specimens are generally designed with a flat (that is, without perspective) border of flowers of the natural size, and with a centre of larger plant-forms conventionalized, often to such an extent as to obscure the forms. The colors are negative shades of a medium or half tint, as regards light, and tending rather to dark, with scarcely any contrast, and therefore a little sombre in character. Three hues largely pervade the surface, — green, red, and blue. These are not pure, but negative; so that the general effect is cool, though rich. These remarks refer to the best types of the Smyrna carpets. There are others, especially such as are now so extensively imported and sold at auction in our principal cities, which are marked by violent

contrasts, — a predominance of yellows and harsh violets. This deterioration may be accounted for by the fact, that many carpets are now made in special manufactories, and that the modern carpets do not exhibit the traditional and inherited taste found in the ancient household fabrication.

It is certain that by far the best specimens of the pure Turkish style are found in what are called the Smyrna styles, made in large establishments in Germany and the Netherlands. Among them, the large carpets and smaller rugs made by the Royal Carpet Company of Deventer, Netherlands, were conspicuous for the taste of their designs, and chasteness as well as richness of color. Nothing more fitting for the repose of a library could be desired than one of these carpets. As they are made by hand, the high price of labor in this country will not admit of their fabrication here. In looking at the best types of all the Oriental carpets, we cannot fail to be struck with the wisdom displayed by the Orientals in adopting negative tones for decorating the floors of their apartments. No people exhibit greater richness of upholstery and costume than those of Persia and India. In the subdued colors of their carpets, they have adopted the best means for enhancing and supporting the splendors of their furniture and the richness of their personal decorations.

The French carpets were represented by magnificent Axminsters, woven for large rooms, in a single piece. The most conspicuous was one representing a wonderful exuberance of tropical forms, — in birds, flowers, and foliage; this fabric admitting the employment of an unlimited variety of hues, tones, and shades. The spectator, however, could not fail to be impressed with the thought that it was better fitted to be hung, as it was, as a drapery for a vast hall, than to be seen horizontally, and trodden under foot. This same impression was given by the Aubusson carpets, than which no fabric of wool can be intrinsically more perfect as works of art. They are, in fact, but tapestries for floors; and are fitted only for palaces or rooms decorated and furnished in the luxurious style of the *Renaissance*. Even here they would seem to detract from the splendors of paintings

and decorations adorning the walls. It seems difficult to eradicate the old ideas of florid decoration from French designers. It is a curious fact that the English find now in France the readiest sale for carpets designed under the influence of the modern English schools of art.

It would be useless to describe what is so well known, — the character of English and Scotch Jacquard Brussels, Wilton tapestry, and Axminster carpets exhibited; and it would be presumptuous to praise them. It is enough to say that they, as a matter of course, proved themselves to be, in texture and design, the worthiest models for our own manufacturers to imitate, and, if possible, to surpass. The observer could not fail to be amused by the singular mistake made by some of the largest English exhibitors, in displaying fabrics designed for adaptation to their own conceptions of American tastes. They seem not to have been aware that representations of lions, tigers, architectural panels, and huge bouquets, are as offensive to the American as to the English educated eye. Recognizing this mistake, an eminent English carpet manufacturer remarked to one of our own at the exhibition: "We seem to be playing at cross-purposes: while we are manufacturing for the supposed American taste, you manufacture for our own."

The carpet manufacture of the United States has become so characteristic a feature of the American textile industry, that this report would be incomplete without a brief sketch of the steps by which it has reached its vast development. In the middle of the last century, a carpet was regarded as a curiosity in our most luxurious city of that period, — Philadelphia; but, as early as 1791, a carpet manufactory was established by a Mr. William Sprague, which attracted so much attention as to induce Mr. Hamilton, in his famous report on manufactures, of that date, to recommend a duty on imported carpets, as an encouragement to home industry. The census of 1810 has been referred to as an authority for the statement, that in that year 9,984 yards of carpet and coverlid, worth \$7,500, were made in Philadelphia. The value indicates either the small proportion of carpets made or their very low value. No exact dates as to the further ex-

tension of this manufacture appear until 1825, at which time it seems that Mr. Alexander Wright, a native of Scotland, — who with others had previously started a small establishment for making carpets in Medway, Mass., — visited a small carpet factory in Philadelphia to learn the mysteries of the art. Meeting with no success, he went to Scotland, where he purchased looms, with which he returned to this country, accompanied by Glaude and William Wilson; who were employed by him to aid in operating his machinery, and who subsequently made considerable improvements in the Jacquard attachments to carpet looms. The location of the works not being favorable, the property was sold to Mr. Frederick Cabot and Mr. Patrick T. Jackson, well known as among the founders of the cotton manufacture of New England. In 1828, Messrs. Cabot & Jackson sold the mill and machinery at Medway to the Lowell Manufacturing Company, which had been recently organized for the manufacture of carpets and cotton goods; the carpet machinery in the mean time being kept in operation until the mill at Lowell was completed. It should be observed, that carpet weaving at Medway, as well as that first undertaken at Lowell, was done in hand-looms.

. It is within the personal recollection of the writer, that at about this time the manufacture of ingrain carpets was undertaken at Great Falls, in New Hampshire, by power; the apparatus for making the figure automatically being a large cylinder or drum, upon which pins or blocks were placed corresponding to the pattern to be woven, the cylinder operating like that of a music box. This apparatus was also used at Little Falls, in New Jersey. This, as well as other automatic devices elsewhere tried, was finally abandoned, as operating less favorably than the hand-loom. In 1844, the hand-loom, both in Europe and this country, was universally used for making carpets.

The system was revolutionized by an American invention, which marks the period of its introduction as the most important epoch in the whole history of the carpet manufacture. Mr. E. B. Bigelow, of Boston, Mass., in 1842, conceived a series of devices for making the carpet loom automatic; so that the costly

labor of men might be dispensed with, and the whole process of weaving might be conducted by women or boys. After applying in vain to several parties engaged in the manufacture, for the pecuniary means necessary for the costly experiment which he proposed, he succeeded in gaining the attention of Mr. George W. Lyman, Treasurer of the Lowell Manufacturing Company, who had the intelligence to understand the importance of the undertaking and the grounds of its probable success. Through the influence of Mr. Lyman, the construction of an establishment with the newly invented machinery was undertaken by the company, at a cost of many hundred thousand dollars. Mr. Bigelow was also seconded by Mr. Wright, the superintendent of the company, in the practical details of the adaptation of the invention. The enterprise and intelligence which assisted in introducing the new improvements were scarcely less honorable than the genius which conceived them. In 1845, the successful weaving of ingrain carpets by power had been demonstrated at Lowell, and its ultimate general use had become a fixed necessity of the manufacture.

From the successful experiment at Lowell, the manufacture of ingrain carpets in this country has been marked by nothing but its constantly extending development. The important establishment at Thomsonville, Connecticut, now known as the Hartford Carpet Company, which used hand-loom concurrently with the Lowell Company, adopted Mr. Bigelow's invention. And each of these two is unsurpassed, by any in the world making similar products, in the amount of production and excellence of fabrics; while many more recent and smaller establishments have their special excellences of fabric. From these sources, the United States has the undisputed command of its own market in ingrain carpets.

The patents for the inventions of weaving Jacquard Brussels and Wilton carpets, although offered to the Lowell Company, were not accepted; and it became necessary, finally, for Mr. Bigelow to utilize his own inventions. The result was the establishment of a factory at Clintonville, now Clinton, Mass., in 1848, which was operated with success; and ultimately, of the organi-

zation, in 1854, of the Bigelow Carpet Company, which became the possessor of the works and franchise of the concern just mentioned. This establishment, the growth of more than a quarter of a century, is now the largest in the world for the manufacture of Jacquard Brussels and Wilton carpets, in which the several processes of worsted spinning, dyeing, and weaving, are united in one concern.

The American claim to the honor of this achievement of inventing the power-loom for weaving Jacquard Brussels and Wilton carpets is fixed by foreign recognition. The supplementary report of the jury at the World Fair in London, where the inventor's carpets were exhibited, says : —

“The specimens of Brussels carpeting exhibited by Mr. Bigelow, woven by a power-loom invented and patented by him, are better and more perfectly woven than any hand-loom goods that have come under the notice of the jury. This, however, is but a small part of their merit, or rather that of Mr. Bigelow, who has completely triumphed over the numerous obstacles that presented themselves, and succeeded in substituting steam-power for manual labor, in the manufacture of fine-frame Brussels carpets. Several patents have been taken out by different inventors in this country [Great Britain] for effecting the same object. But as yet none of them have been brought into successful or extensive operation ; and the honor of this achievement, one of great practical difficulty as well as of great commercial value, must be awarded to a native of the United States.”

Axminster carpets, adapted only for the most luxurious use, until recently made exclusively in France and England, are still woven in those countries on hand-looms. A patent for weaving these carpets by power, the invention of Alexander Smith and Halcyon Skinner, of New York, was granted in 1856. On account of the civil war, and the destruction by fire of the establishment where the invention was first applied, it did not come into considerable use before 1867, when the factory was rebuilt and the machinery set at work. The product of the establishment under the proprietorship of Alexander Smith & Sons is about 200,000 yards a year, — an amount believed to be equal to the entire annual production of the same kind of goods in

France and more than is made in Great Britain. One of these power-looms, attended by one competent woman, will produce in a day an amount equal to the product of ten English or French hand-looms, attended by as many men. The loom is not adapted for weaving the wide single-piece carpets made in the foreign hand-looms; but this inconvenience is almost wholly obviated by the perfect selvage and matching of the figures of the narrow pieces, which also may be applied to floors of any dimensions.

Tapestry carpets, known as tapestry Brussels and tapestry velvets, form a very important branch of the carpet manufacture of England and the United States. This style of carpet, of quite recent invention, is particularly adapted to the popular demand for brilliant effects at moderate prices; for there is no form of carpet in which so good an appearance can be secured at so low a cost. In all other carpets, the yarns are dyed. The principle of the fabrication of these carpets consists in *printing* the colors upon the warps in such a manner that, when the warps are woven, they form the desired figure. In this style of carpet, the room for the application of color and design is unlimited.

The method of printing the warps, which constitutes the essential feature of the tapestry carpets, was the invention of a Mr. Whitock, of Edinburgh, Scotland, about 1838. The invention met with little success, until the right to apply it in England was secured by Mr. John Crossley, of Halifax, England, about 1842. With his characteristic energy and skill, he made the fabrication a perfect success; and the establishment founded by him still makes the largest production of this fabric of any other in the world.

In 1846, Mr. John Johnson, an Englishman, educated in Crossley's establishment, and who had himself put up the first machinery for this branch of fabrication at Halifax, came to this country, and established the manufacture of tapestry carpets at Newark, New Jersey; running about 25 hand-looms. He was facilitated in his enterprise here by the fact that Whitock had taken out no patents in this country. Mr. Johnson subse-

quently removed his establishment to Troy, New York, where the manufacture was carried on for two or three years under his direction, though not in his name. In the fall of 1855, the machinery was purchased by a company of which Mr. M. H. Simpson was the principal stockholder; and removed to Roxbury, Mass., in 1856. The great inventive power of Mr. Simpson, seconded by the experience of Mr. Johnson, have secured for the Roxbury Carpet Company the prominence in this manufacture displayed by its beautiful fabrics at the Exhibition. This company has by no means the monopoly of this manufacture in this country. Its claims for superior excellence are contested by Messrs. Higgins & Co., of New York; Alexander Smith & Sons, of Yonkers; Stephen Sanford, of Amsterdam, N. J.; Messrs. Dobson, of Philadelphia; and others.

The progress made in the manufacture since its first introduction is remarkable. The product of the first hand-loom was but five yards per loom per day. In 1856, the product of the Roxbury Carpet Company for each loom per day was sixteen yards. At present, the average product of each of the 114 looms employed is $49\frac{1}{2}$ yards per day. This is largely due to the invention of the power-loom of Mr. Bigelow, the principles of whose inventions are applied in weaving these fabrics.

Particular reference has hitherto been made only to the carpet manufacture of New England and New York, which is characterized by its few vast establishments. The city of Philadelphia, alone, surpasses all establishments combined, in the extent and variety of the carpets which issue from its looms. A prominent characteristic of the Philadelphia manufacture is the diffusion of the industry in small establishments. Philadelphia, with its cheap homes, its abundant and cheap market, and the faculty, which it seems to possess above all other cities, of appropriating the talents of the artisans which resort to it, is the paradise of the skilled workman. There, as nowhere else in this country, the loom of the handicraft carpet-weaver still finds abundant occupation through the smaller manufacturers, who employ his skill, and furnish the raw material to be worked up by the weaver and his family in their own houses. The

carpet manufacture of Philadelphia is distinguished for its success in making sightly and useful carpets out of cheap materials, adapted for the most modest homes; and its carpet makers are among the few American manufacturers who have been able to profitably export their products.

While small establishments is the rule in the carpet manufacture of this city, there is one under an individual proprietorship of comparatively recent foundation, — that of Messrs. John & James Dobson, — which employs between two and three thousand workmen, principally in carpets. There are also notable exceptions to the general rule of manufacturing the cheaper products; Messrs. McCallum, Crease, & Sloane having exhibited ingrain carpets of the highest class (which, in design and fabrication, compared favorably with the best in the Exhibition); and the Messrs. Bromley, Venetian carpets illustrating the best merits of that class.

We have not attempted in any other department to exhibit the present amount of production; but the carpet manufacture is so prominent a feature of our textile industry, that we have taken pains to obtain from original sources the amount of production in 1875.

The Carpet Association of Philadelphia has furnished Mr. Lorin Blodgett, for his work on the industries of that city, the statistics of its carpet manufacture in 1875. The report for 1875 claims the total value of the carpets manufactured in that city to be \$19,000,000; and that the increase of machinery since 1869, in the form of mills, steam-power looms, &c., was more than one hundred per cent. Returns furnished to us by the six following establishments outside of Philadelphia, viz., the Bigelow Carpet Company, the Hartford Carpet Company, E. S. Higgins & Co., the Lowell Manufacturing Company, the Roxbury Carpet Company, show that the actual value of carpets made by these companies was \$11,126,168. We feel authorized in estimating the product of other mills out of Philadelphia, not enumerated, at \$2,000,000.

RESUMÉ OF AMERICAN PRODUCT IN 1875.

Philadelphia	\$19,000,000
Other mills enumerated	11,876,168
Non-enumerated	2,000,000
Total value of American production of carpets in 1875	\$32,876,168

This enormous production finds its sole consumption in American homes,—a fact whose social significance needs no comment.

While we wish to speak with becoming modesty of our attainments in this manufacture, it is but just that we should meet the objections which prejudice and custom always and naturally interpose against the substitution of an American for a long-time-popular foreign fabric. The first objection is the character of American designs; for, all other things being equal, it is the design which gives the preference. And, as the prince of dry-goods merchants in this country was wont to observe, "A preference is a profit." It is capable of demonstration, that our power-woven carpet fabrics have no deficiencies in selvage, closeness and uniformity of texture, or length of pile. In regard to patterns, each of our principal establishments has its own designers, who are very liberally paid. We do not claim absolute originality in our designs. There is no such thing known in the decorative arts. The elements of design are an alphabet whose letters are common property for all who apply the language of art. But we do claim that the American designs for carpets are now as often copied by the English, who are our rivals, as theirs are by us. We are not the less ready to give our hearty acknowledgments to the influences of the English taste. But this taste is a result of the culture of the day, of which America in no little degree partakes. The United States now has its great centres for the cultivation and diffusion of taste; less marked, it is true, than London and Paris, but having no little influence. Boston, New York, and Philadelphia, practically the controlling seats of our carpet manufacture, abound in men, and above all in women, of wealth and of taste, which latter has been expanded and refreshed by

foreign travel. These cultivated consumers impart their suggestions to the manufacturers ; for it is the consumers, not the producers, who fix the prevailing modes.

There is another influence, not less important, resulting from our great commercial centres. The old antagonism between importers and domestic manufacturers of carpets has in a great degree ceased. Our largest importers of foreign carpets have recently become owners or stockholders in our leading domestic establishments. Some of them, as we have before shown, are direct importers of Persian and India carpets ; and their warehouses vie in the display of Oriental carpets with the best establishments, and even museums, of Europe. Our designers are not compelled to borrow Eastern ideas from second-hand European models. Equally with European designers, they drink from the original and pure font of inspiration, — the Oriental sources. For *Renaissance* designs, like all the rest of the world they must resort to France.

Another popular prejudice still lingering among the ignorant is the alleged deficiency of American dyes. We are far from claiming originality in the arts of dyeing ; but we do claim that we have the means, and use them liberally, for attracting to our establishments the best skill in Europe. The markets of the world in dye-stuffs are open to us, and our tariff has made all of them substantially free of duty. Parsimony is not a characteristic sin with Americans ; and the intelligence of our manufacturers forbids the idea that they would be sparing in the essential means of giving the last finish to their fabrics. No purer waters in the world can be found than in the springs supplying our establishments, — all flowing from primitive soils, and without calcareous taint ; while our bright suns give facilities for perfectly developing colors which surprise the dyers accustomed to the cloudy skies of Europe.

The principal exhibitors of American carpets, by displaying them together in a series of alcoves, made their united exhibits in this department unusually imposing ; and the proofs of our attainments in this manufacture were observed with no little surprise. It was manifest, from the absence of rival foreign exhib-

itors, that, in respect to the carpets of the cheaper and medium qualities, up to two and three ply ingrain, the competition is confined to our own manufacturers. Even rival English manufacturers generously admitted, that, in the production of Jacquard Brussels, tapestries, and Wiltons, and narrow Axminsters, we have nothing to learn from them either in design or fabrication.



CLASS 240. — *Hair, Alpaca, Goat's Hair, and other Fabrics, mixed or unmixed with Wool.*

Of the materials other than wool proper composing fabrics, but ranked with it because possessing the same general properties, the first in value is the product of the goat of Thibet, commonly called the cashmere goat, — a distinct variety inhabiting the elevated regions north of the Himalayas. This variety, whose origin is obscure, has affinities with the Angora race. Its size is quite large. The horns are flattened, straight, and black, and slightly divergent at the extremities. The ears are large, flat, and pendent. The exterior fleece or hair, which is long, silky, and lustrous, is divided on the back, and falls down upon the flanks in wavy masses. Beneath the hair, there is developed in autumn a short and exceedingly fine down, called *pushm*, from which the cashmere shawls are fabricated. The quantity of *pushm* obtained from a single animal is quite small; never exceeding 108 grammes, and usually much less, to the individual. The separation of the kemp, or coarse hair, from the *pushm*, which is indispensable for making the shawl yarns, is a work of great labor. The raw or unprepared *pushm*, it is said, costs in India about seventy-five cents per pound; but the labor of separating the kemp, at the low rate of four cents a day, is so great as to bring the cost of the pure *pushm* up to seven or eight dollars per pound.

Well-arranged specimens of the *pushm*, as well as magnificent samples of the shawls fabricated from this material, were shown in the India collections. One in the exhibition, imported by an English house, was valued at \$1,137. The prices of shawls

actually of Indian fabrication descend as low as twenty dollars. The inferior shawls are made in Kerman, in Persia, as well as in India, the material called "koork" proceeding from a particular kind of white goat, distinct from the Thibetian animal. Numerous flocks of these goats are kept at Kerman. They are cultivated in the same manner as the merinos formerly were in Spain : being *transhumant*, — or feeding in the valleys in winter, and on the distant mountain-plateaus in summer. A large part of the Kerman koork is annually exported to Upper India, where it is manufactured into false India shawls. It is the koork, and not the pure cashmere pushm, as is commonly supposed, which forms the material of the richest of the Persian carpets, — a magnificent specimen of which is in the collection of the Boston Art Museum ; and one from Khorassan, much inferior to that, in Messrs. Sloanes' warehouse in New York, although but six feet by four in size, is valued at \$275.

The fabrication of cashmere shawls in Europe has been attempted only by the French. The peculiar Indian texture called "espouline" was perfectly achieved in Paris in 1834 ; 4,000 workmen being employed, while some 400 goats were imported from Thibet. But it was found that the raw material, expensive as it is, formed not more than one-tenth of the cost of a shawl ; that French workmen could not compete with the Indian weaver, working at less than one-fifth of his wages ; and that ladies of fashion would pay twice as much for a genuine India shawl as for a French article really superior in texture and design. The manufacture has, therefore, been abandoned. Since the monopoly of the East India Company has ceased, the French have reconciled themselves to the loss of this manufacture, by making Paris the principal *entrepôt* in Europe of the India shawl trade.

The inferior pushm or koork, from which the kemp is not separated, is at present largely used by the French in the fabrication of cashmere dress fabrics.

The next analogous material, in value and importance, occupying the place of wool, is mohair, — the product of the Angora goat. As this material could not be properly discussed under

the head of "wool," in Part I. of this report, — while it is rapidly becoming an important object of American production, — it may not inappropriately receive consideration in this connection.

The Angora goat (descended, as proved by modern naturalists, from a distinct wild species of Thibet, — the Falconer's goat, *caprus Falconeri*), it is supposed, was carried by the migration of pastoral tribes from Thibet, in the eleventh and thirteenth centuries, to the country in Asia Minor near Angora — the ancient Ancyra — where they principally abound, and from which the recent diffusion has taken place. Their existence was not made known to Europe until 1655; and the first full description of them was given by the celebrated botanist, Tournefort, the master of Linnæus. But so little was popularly known of them, that some of the old dictionaries define mohair as the hair of a Turkish dog. The chief supply for commerce still comes from Asia Minor, the country being in the Turkish territory. The superbly mounted specimens of these animals in the Turkish department must be remembered by all visitors at the exhibition.

The many attempts made to acclimate the Angora goat in various parts of Europe have met with signal failure; the generally prevailing moist climate being unlike that of their native habitat. The first importation into the United States, consisting of eight animals from Asia Minor, was made in 1849, by Dr. J. P. Davis. Other importations were made by Mr. Dhiel. These and their descendants were distributed principally in the Southern States. Mr. Winthrop W. Chenery, of Belmont, Mass., an eminent merchant and stock-raiser, imported about 300 pure-blood animals, and introduced the first full-blooded animals of this race into California. Mr. A. Eutichides, a native of Greece, came to this country from Asia Minor in 1869, bringing a flock of Angora goats with him. A part of this flock was sent to California; the rest of the flock, numbering fifty-four in 1875, is in the possession of Mr. F. S. Fulmer, of Spring Mills, Appomatox County, Virginia, and has been kept perfectly pure. A flock of several thousand pure

and grade animals of this race is upon an island in California; and several thousand are stated to be scattered through Oregon. The acclimation of the race, so difficult elsewhere, has been perfectly accomplished in the comparatively dry climate of this country, — especially in the high regions of the South and the interior. The only obstacle to success is the greediness of breeders, who are too apt to sell for breeding purposes grade animals. It is only by the constant use of absolutely pure bucks that merchantable mohair can be procured. For further information on this subject, the reader is referred to a monograph on the "Angora Goat, its Origin, Culture, and Products," by the writer, published in Vol. XI. of the "Proceedings of the Boston Natural History Society," and in Vol. VI. of the "United States Reports of the Exposition at Paris, of 1867."

Mohair, the fleece of the Angora goat, is not a mere substitute for wool, but occupies its own place in the textile fabrics. It has the aspect, feel, and lustre of silk, without its suppleness. It differs materially from wool in the want of the felting quality; so that the stuffs made of it have the fibres distinctly separated, and are always brilliant. On account of the stiffness of the fibre, it is rarely woven alone; that is, when it is used for the filling, the warp is usually of cotton, silk, or wool, or the reverse. The distinguishing qualities of the fibre are lustre, elasticity, and wonderful durability. The qualities of lustre and durability, particularly, fit this material for its chief use, — the manufacture of Utrecht velvets, commonly called "furniture plush," the finest qualities of which are composed principally of mohair, the pile being formed of mohair warps, which are cut in the same manner as silk warps in velvets. Upon passing the finger lightly over the best Utrecht velvets, the rigidity and elasticity of the fibre will be distinctly perceived. The fibre springs back to its original uprightness when the pressure is removed. The best mohair plushes are almost indestructible, and are now in general use by all the principal railroads, as the most enduring of all coverings for railroad seats. The English have attained the greatest success in spinning mohair, and the French and German manufacturers use English yarns. In the

manufacture of Utrecht velvets, the city of Amiens, in France, holds a marked precedence, and the plushes exhibited by her manufacturers, in Philadelphia, of all hues, plain and figured, well sustained her reputation. Another analogous application of mohair is for forming the pile of imitation seal-skins. Some of these fabrics, exhibited by manufacturers of Huddersfield, England, were of special beauty, the resemblance to real fur being quite striking. Admirable imitations of the Astrakhan lamb-skin furs in mohair were exhibited by the same manufacturers. Similar goods, made by one of our associate judges, Dr. Weigert, — who, by his position, was precluded from an award, — received high commendation. Mohair forms an essential material in the best carriage and lap robes, with a long and lustrous pile. Some exhibited were made to resemble the skins of tigers, leopards, and other animals; and others were printed. Among the last, some made by a manufacturer in Sandford, Maine, were conspicuous for excellent texture and design. Another application of mohair is for the fabrication of braids for binding, which have the lustre of silk, but far greater durability. Excellent specimens of this fabrication were exhibited by T. M. Dale, of Newark, New Jersey. Still another important application of this material is in the fabrication of black dress goods, resembling alpacas, the mohair being woven with cotton warps. They are called mohair lustres, or brilliantines. Beautiful exhibits of this admirable fabric were made by the Arlington Mills and the Farr Alpaca Company. Mohair is also used in France in the manufacture of laces, which are substituted for the silk laces of Valenciennes and Chantilly. These, however, do not come within the consideration of this group.

The soft fibre of the vicuña of South America, composing fabrics which are peculiarly agreeable in feel, was exhibited in very pleasing shawls made by English and California manufacturers. But the most interesting of the new fabrics were the cloths made of camel's down, which have recently come into extensive use in Russia.

The Roumianstoff Cloth Manufactory of General Siloverstoff,

situated in the Volga Province of Russia, exhibited beautiful plaids, blankets, and other tissues, adapted for the most luxurious consumption, manufactured from picked camel's hair and goat's down. These products find a ready sale in Persia. More interesting still was a stout and leather-like, though soft, cloth, without nap, made from a mixture of merino, Russian, and Kirghese wool, with camel's down, called "half-merino." This is dyed a pale yellow tint, and finds an extensive sale among the Asiatic tribes under the name of *jeltiak*. These tribes, from time immemorial, have dressed in yellow cloth made exclusively of undyed camel's hair. The appearance of a dyed cloth in which the camel's hair was mixed with wool, acquiring greater strength, yet having the same color, has caused the Asiatics to substitute the *jeltiak* for the original camel's-hair fabric. This cloth has now great repute among the Caucasian Arminians, and the Persians living on the coasts of the Caspian Sea. The success of this manufacture is in a measure due to the invention of a particular apparatus by means of which the soft and downy parts are separated from the fleeces of coarse Siberian and Kirghese sheep and goats; the down of the Siberian goat producing stuffs remarkable for their softness and lightness.

The celebrated Montagnac coatings, first made in France about twenty years ago, by processes patented by the inventor whose name they bear, had beautiful illustrations at the Exposition, from Sedan. They are sometimes called cloth velvets. The pile of the surface is usually furnished by fibres of cashmere wool, incorporated in the yarns of the fabric, and they are straight and perpendicular to the surface; the cloth having the aspect of a silk velvet, but with a softness peculiar to the cashmere fibre. The pile is developed on the surface by *battage*, or beating the moistened cloth with elastic rods.

Formerly, only the long hair of the cashmere goat and camel were used, besides wool, for making pile fabrics. In 1850, Mr. Benjamin Crosland, of Huddersfield, England, invented or rediscovered a process by which the short hairs of the cow and calf could be used in the manufacture of imitation seal-skins.

The main feature of his process consisted in boiling the fabrics for a long time in water, which develops the lustre of the fibre. These fabrics were for a long time imported into the United States under the pretence that they contained no wool, being thus subjected to a less duty. A rigorous microscopic examination by the National Academy of Sciences, made quite recently, under the direction of the Secretary of the Treasury, seems to have established the fact, that the short hairs of the cow and calf are spun at least with enough wool to carry the fibre, — a successful spinning seeming otherwise impracticable. The cow-hair seal-skins, which are an important specialty in England, were illustrated by beautiful specimens at the exhibition.

Another animal product, which is not strictly a textile fibre, because it cannot be spun like those above referred to, must be considered in this connection, — that is, horse-hair, the material of the fabric ordinarily known as "haircloth." This material, as a covering for furniture, a century ago was held in high consideration. The wife of Benjamin Franklin, describing the furniture of her mansion in Philadelphia, says it was covered with black haircloth, "as handsome as *padisoy*" (Padua silk). Modern fashion has driven this material from fashionable drawing-rooms; but its durability still causes it to be retained in unambitious apartments. There were two conspicuous exhibits of this material. Ranking first in elegance was an exhibit made by Edward Webb & Son, Worcester, England. These haircloths were woven in stripes of rich blues, scarlets, and crimsons, with whites, and in simple but rich colors, brocaded and figured. They possessed all the elegance which could be given to this material; and for certain purposes, as for summer apartments and houses in tropical regions, possess adaptations found in no other upholstery materials.

As a balance to this panegyric on an English fabric, we may be permitted to dwell, in some detail, upon the American exhibit of this fabric made by the Pawtucket Haircloth Company, of Rhode Island. The peculiarity of their exhibit was that it is the result of the first successful weaving of haircloth by power;

the hand-loom being, as far as known, used by all other manufacturers of this fabric at home or abroad. The success of the company referred to is due to their achievement of the work of picking up, and applying automatically, each individual hair which is to compose the texture of a hair filling, interlaced by a warp of cotton thread. This is accomplished by a little machine, which could be packed in a box two inches square. This machine, which is detachable for repairs, is attached to a loom; both the machine and loom being operated by power, and it forms the pivot upon which the whole manufacture rests. It is essential that the machine should pick up but one hair at a time. To accomplish this, the picker in the machine has a groove or slit invisible to the naked eye; so that the whole of this manufacture turns upon a point which can only be seen with a microscope. The loom is so adjusted that the movement of the web is arrested until the picker lifts up its hair. The end of the hair is seized by a rod, the end of which operates like a thumb and finger, and is carried transversely between the warps. This little apparatus is attached to 400 distinct looms in the establishment of the company. One girl tends ten looms; and this one girl, by means of this machinery, does the work requiring twenty operatives on hand-loom. By means of these appliances, this single establishment, employing only 150 work people, produces 600,000 yards of haircloth per annum; each loom weaving five yards per day. It consumes annually 450,000 pounds of horse-hair, equivalent to the tails of 600,000 horses. The large exhibit showed the unquestionable superiority of the machine-made goods to the ordinary hand-loom fabrics.

All the classes assigned to the judges of this group, in the department of wool, have now been considered, except that of wool machinery. While all the varieties of wool fabrics were well illustrated, the wool machinery exhibited but very few of the modern appliances by which the fabrics are made. The fullest description of the machines exhibited would give but a faint idea of the improved machines now in use. To describe

even those exhibited would require space and means not at our disposal, and would be unsuited to the popular object of these reports.

The writer is aware, that, in giving predominance to American exhibits, and in the importance which he has attached to each achievement made in our wool-manufacture, he is liable to be charged with the conceit not unfrequently spoken of as one of our national attributes. But it must be remembered that this apparent predominance is due to the fact that we have simply placed our own products in the foreground of a picture which represents all other national products, though in more distant perspective; and that this prominent position for their own fabrics is a right which has been claimed at all the International Expositions by the reporters of the country in which the Exhibition has been held. Our object has been less to compare ourselves with other nations, than to contrast the present and past periods of our industrial history, as was demanded of us in a centennial celebration. If we are complacent in view of our own progress, we do not forget that the progress of other nations is less marked because their field for improvement has been more limited; and that, as we approach the position in the first ranks among the competing manufacturing nations to which we aspire, we shall be called upon for higher proofs of skill, inventive power, and creative taste, than we have yet displayed.

Respectfully submitted,

JOHN L. HAYES.

PART III.

SILK AND SILK FABRICS.

SILK with its fabrics, by the value of the raw material, corresponding to an equal weight of silver, its tenacity equal to that of iron, and its lustre surpassed only by that of the precious metals and stones; by the splendor of its fabrics, their relations to the decorative arts, their influence upon painting, heraldry, and the ceremonies of the church, their place as a means of exchange in early commerce, and the correspondence of their production in Western Europe with the decline of Oriental power, — would seem to claim a more extended notice than we have given to the homelier fibre and fabrics which have thus far occupied our attention. But the popular interest attaching to silk and its fabrics has made knowledge of the subject so general that we could hope to add little to the common stock of information as to the sources of this fibre or the history of its Oriental and European fabrication. Besides, we do not forget that the principal source of the popular knowledge of this subject in this country is the exhaustive report prepared by Mr. Cowdin, the chairman of this group, in his former official position as an American Commissioner at the Paris Exposition of 1867, and that it would be vain to expect to glean from a field which had been so thoroughly reaped and harvested.

The writer will confine himself, in this portion of his report, to a brief sketch of the more general impressions made by the foreign exhibits of fabrics of silk, — omitting notices of the raw material, and not attempting any analysis or minute comparison of foreign fabrics, — and to a notice, more extended, of American products.

Before proceeding with these sketches, it is but an act of duty for the writer to refer, as he can without indelicacy, to the character of the work performed by the subdivision of the judges of Group Nine intrusted with the examination of silk. They

consisted of Mr. Gustav Gebhard, a practical manufacturer of Elberfeld, Germany, one of the most celebrated and extensive fabricants in Europe, whose facility for work in this department was aided by his rare command of all the Continental languages; Mr. Louis Chatel, an eminent manufacturer of Lyons, who, confined to his chamber by an unfortunate accident, still insisted upon having samples of all the fabrics under examination submitted to him in his chamber; Mr. Hayami Kenzo, an accomplished Japanese gentleman, the government director of silk-reeling establishments in his own country; Mr. August Behmer, an Egyptian gentleman, familiar with the production of raw silk; Mr. John G. Neeser, a Swiss gentleman; and Messrs. Cowdin and Le Boutillier, Americans, — the latter three of very large experience in the silk trade. All the exhibits were carefully inspected in the cases by the judges of the subdivision, and submitted to subsequent examination and tests through samples. The sewing silks and twists exhibited were submitted to rigorous tests by machines and otherwise, to determine their smoothness and tenacity; careful notes being taken of these experiments. Brief as the awards are in this subdivision, their value is greatly enhanced by the high character of the judges and their conscientious and rigorous examination. To American exhibitors in this department, especially, will the high awards they have received from foreign manufacturers, from whom even mention is praise, be of peculiar value. The writer, instructed, as he could not fail to be, by daily intercourse with his accomplished associates, and guided in his observations by their direction, has less diffidence in offering the notes which follow.

France, as occupying the first position among the silk manufacturing nations, having had a production in 1874 of \$116,000,000, and an export of \$95,000,000, — a production three times as great as Germany, which next follows her, — commands the first notice. The principal French display of silks, being in a somewhat secluded court, was made more pleasing from the exclusion of other objects, and the brilliancy of the fabrics was enhanced by the extreme simplicity of the cases

enclosing them. No section of the Exhibition was more attractive than this court; displaying as it did the models of perfection in the most luxurious department of the textile industry, and the most brilliant and artistic products which the weaver's art can create. In this court were gathered the substantial proofs of that aspiration for ideal excellence in the material, fabrication, and artistic form of her products, which has given to France the crown of industrial glory. With all the pleasure conveyed to the eye and senses by graceful designs and infinitely varied colors, by gorgeous decoration and unexpected combinations of material or color, perhaps the chief satisfaction derived from the inspection of the products of this court resulted from the consciousness that they were the best results hitherto attainable by human effort in one great department of industry. Another vivid impression made by this court was that the industry it displayed was the product of an æsthetic culture, general and special, without example in the world, and of influences such as have existed in no other nation. The industry was planted by the royal foresight of King Henry of Navarre, and sustained by the political economy of Colbert. It grew up in the genial atmosphere of the most splendid courts of Europe. The chemistry of Berthollet and Dumas furnished dyes for its fabrics; the traditions of the Renaissance and the pencil of Watteau gave it designs; and Chevrueil imparted to it the secrets of harmonizing and contrasting colors. While, in later periods, the protective influences of the government (whether empire or republic) have never been wanting, the pre-eminence of the silk manufacture of France has been sustained by a working population who have inherited the traditions and secrets of manipulation from generations of artisans, and by art schools for workmen which Lyons was the first city in the world to inaugurate.

The visitors at the Exhibition, whose imagination had been excited by the learned researches of Michel upon the precious stuffs of the Middle Ages, or the splendidly colored plates of the characteristic silken tissues of every period recently published in Paris, might have experienced some disappointment at the

comparatively small display of the figured brocades, damasks, and velvets so conspicuous in the personal costumes of the earlier periods. Mainly, as is asserted, through the influence of the Franco-Prussian war, which plunged France into mourning, the figured and brocaded stuffs were replaced by plain fabrics in personal costumes, although now beginning to reappear. It may not be generally known that it is in the perfect fabrication of the plain stuffs, especially the plain black silks, that the highest art of the manufacturer consists, as no inequality of thread or unevenness of tissue or dye can be concealed by the figure. Of the plain tissues of this description in this section recognized by the expert judges as of incomparable excellence, it is useless to attempt a description. To be appreciated, they must be seen or worn.

There was no lack of fabrics whose beauty was due to design and color. Conspicuous among them were printed foulards, upon which the arts of design and of impression would seem to have been exhausted. The miraculous power of the Jacquard loom to produce the most complicated designs was most tastefully and appropriately shown in a woven representation in silk, upon a background of tissue, about two feet long and as many broad, of the mulberry in leaves and fruit, with the silk-worm and moth in every stage of development; the colors exquisitely shaded, the mulberry branch being intertwined with a ribbon bearing the significant motto, *vestit, ornat, dilut*.

Although decoration is sparsely used in stuffs for dresses, it still finds an infinite field for application in stuffs for upholstery, and especially in fabrics for church vestments. Antiquarian learning seems to have exhausted itself in seeking examples and authorities in the past for forms and colors of ecclesiastical vestments. Silk, gold, silver, and jewels glitter on the copes, the chasubles, the mitres, the stoles, and altar cloths, of the church more prodigally, and combined with higher skill, than they could have done in the most splendid period of mediæval history. It is said that in some of these tissues the workman can weave not more than an inch in a day, and the prices sometimes attain the enormous sum of \$300 per yard. The most

brilliant display of these fabrics, as well as those for upholstery purposes, was made by Messrs. Tasiman & Chatel; the latter being a judge, the exhibit was precluded from an official award. Their magnificence equalled all that the imagination could conceive. An interesting feature of some of these fabrics was a reproduction of Oriental types, illustrating the views maintained by the learned M. Michel, that the figures on heraldic coats of arms were derived from silk stuffs of the East, of which the representation of animals—such as lions, leopards, eagles, griffins, &c.—formed the ordinary ornament. On one of the fabrics exhibited by Mr. Chatel, with a background of gold and red, was interwoven, so as to cover the surface, repeated figures of elephants, horses, falcons, cocks, dogs, deer, and mounted horsemen; all designed conventionally, or in heraldic style.

To illustrate the extent and variety of the silk products and producers of France, as well as to pay a deserved tribute to the typical silk manufacturers of the world, we subjoin a list of the principal French exhibitors, with the products.

Black Silks	C. J. Bonnet's Sons & Co., Lyons.
Black Silks	Jaubert, Audras, & Co., Lyons.
Black Silks	Tapissier Son & Debry, Lyons.
Black Silks	Gourd, Croisat Son, & Dabost, Lyons.
Black Silks	Antoine Guinet & Co., Lyons.
Black and Colored Velvets . .	Gautier, Bellon, & Co., Lyons.
Black Velvets and Colored Silks	J. P. Million & Servier, Lyons.
Black Velvets	Font, Chambeyron, & Benoit, Lyons.
Black Silk Velvets	C. J. Servant & Co., Lyons.
Black Dyed Silks	Gillet & Son, Lyons.
Dress Silks and Novelties . .	Poncet, Senior & Junior, Lyons.
Colored Silk Goods	Faye & Thévenin, Lyons.
Silk Goods	Sevène, Barral, & Co., Lyons.
Damask Silks and Novelties .	Bresson-Agnès & Co., Lyons.
Colored Failles and Gros-grains	Bardon & Ritton, Lyons.
Striped and Fancy Silks . .	Mauverney & Co., Lyons.
Siciliennes	Audibert, Monin, & Co., Lyons.
Poplins	J. Drogue & A. Monnard, Lyons.
Foulards	A. L. Trapadoux & Co., Lyons.
Foulards	Jandin & Duval, Lyons.
Foulards	Gondard, Cirlot, & Martel, Lyons.
Hatters' Plushes	Huber & Co., Paris.

Black and Colored Satins . . .	Brosset-Heckel, & Co., Lyons.
Hatters' Plushes	J. B. Martin, Tarare.
Crapes	Montesny & Chomer, Lyons.
Umbrella Silks	Alex. Giraud & Co., Lyons.
Velvet Ribbons	F. Brioude, St. Etienne.
Velvet Ribbons	Giron Brothers, St. Etienne.
Sewing Silks	Benoit, Tabard, & Co., Lyons.
Silk Gauzes and Bolting Cloth .	L. Dornon, Lyons.
Bolting Cloth	L. R. Gascou, Montauban.
Raw and Sewing Silk	Joseph Puydebart, Lyons.

Germany, although ranking second in the production of manufactured silk, — having had a production of the value of \$38,000,000 in 1874, — was represented by few exhibitors, awards having been made but to five exhibitors; viz., to Escales & Hatry, of Saargemünd, for silk plushes for hatters' use, of remarkable perfection in color and finish; to Gressard & Co., of Hilden, for foulards of high excellence; to Carl Mez & Sons, of Freiburg, Baden, for sewing silks of great beauty in color and finish; Massing Brothers & Co., Püttlingen, for hatters' plushes of high excellence.

But the paucity of exhibitors from Germany was atoned for by the beauty of exhibits made by Mr. Gustav Gebhard, of Elberfeld, who, on account of his position as judge, was precluded from an award. In the absence of the notes promised by Mr. Gebhard, we are compelled to trust only to our own memoranda and impressions. The products of the establishment represented are understood to be furnished by the labor of some four thousand persons, not employed (as with us) in a single establishment, but working hand-loom in their own houses. The goods, exhibited in two very large cases and most tastefully arranged, consisted of figured velvets, satins, and brocades, many of them executed in silver and gold. A striking feature of the exhibit was the designation by cards of the markets for which the several fabrics were specially destined. India, Siam, Batavia, Constantinople, had each their special fabrics, in which the characteristic features of the native productions of different Oriental countries were reproduced, doubtless with cheaper materials, but with attractive effects. The

native industries of the East are thus wounded by arrows feathered from their own wings. It is remarked by Prof. Thompson, in a notice of the Exhibition, that the Elberfeld display "showed just the business qualities—the promptness to anticipate wants and accommodate tastes—in which the Germans are especially deficient. But it represented a very peculiar and exceptional district of Germany,—the wide-awake Calvinists of Westphalia, the Yankees of the Rhine valley, whose mode of thought and ways of working resemble far more those of their coreligionists of Switzerland, Holland, Scotland, Lancashire, and New England, than of Luther's less business-like disciples throughout the Fatherland."

The reference to copies of Oriental fabrics leads us naturally to the original fabrics of silk which were exhibited from the East. The India Museum's most attractive and instructive exhibit contained beautiful specimens of India silks. Conspicuous among them was a brocade long scarf, or *Kincob*, from Benares, in which, from silver leaves placed on a dark or deep red ground, spring gold flowers with black centres. Another brocade, of wonderful beauty and exquisite texture, is composed of a gold ground, varied or shaded by delicate shades of silk, in low tones of blue and red. The figures in these brocades are all conventionalized. Still another attractive fabric was a fine silk gauze, embroidered with gold in flattened or hammered scales.

More instructive to the student of textiles than the few large and brilliant samples of fabrics, was the collection, made under the direction of the East India Museum, of the splendid volumes, albums, and framed samples of all the textile fabrics of India, in which the wonderful variety and perfection of the native silk fabrics of India are admirably displayed. The expense of a series of these samples (about \$2,000) forbids their possession by individuals; but none of our industrial or art museums should fail to have these admirable models of industrial art-work.

Among the silk fabrics shown at the Exhibition, there was nothing surpassing the scarf-like brocades from Sumatra and

Java, exhibited in the collection of the Netherland's colonies. They belong to the native princes, and were lent for the purpose of exhibition in Philadelphia. They were all of native production. A model of a rude loom was exhibited, upon which they are said to have been woven. But it seems inconceivable that such fabrics could have been produced by such rude mechanism. The ends of the scarfs are fringed with flat tassels of silver, rudely made and unpolished. The fabric is of silk of a dull red tone, shot with gold thread. The terminal borders are well marked and broad. The designs are arabesques of a geometrical construction, — no figures of flowers or animals being introduced, — but of a most subtle and ingenious character. Although the texture is nearly covered with gold, it is scarcely apparent; and the general tone of the fabric is low and subdued. This subdued effect is produced by the neutral tone of the silk, and the manner in which the design is made to spread all over the texture.

Japan and China, although leading all other nations in the supply of raw material, and in silken embroideries unequalled, were inferior in the artistic character of their woven goods to India and Java. The plain colored satins of China were of excellent manufacture; and a fine exhibit consisted of colored and figured silks, which were declared by the judges to be marked improvements over former productions of that country. Among the exhibits from Japan, the most conspicuous for excellence were the silk crapes, white, dyed, and printed; the dyed cherries and scarlets being notable for the perfection and brilliancy of their hues, while others were most skilfully shaded. Productions of silk from cocoons of worms feeding on the walnut, and others from worms feeding on the oak, were interesting. The most curious of the Japanese fabrics were brocades of great apparent richness, on account of the gold woven in the tissue; gold flowers and leaves being intermingled with scarlet flowers upon an indigo-blue ground. The threads of gold forming the warp, upon close examination were found to consist of exceedingly narrow or thread-like strips of *paper, gilded*, but only on one side; the gilded side being invariably brought to the surface in the tissue.

It was observed by experts that this effect could only be produced in hand-loom.

The less remote Oriental nations — Turkey, Tunis, and Egypt — showed that they had not lost the arts of silk fabrication which they once enjoyed in supreme perfection. The damasks and brocades, woven in silk alone, or mixed with gold and silver, though Oriental and characteristic in design, in many cases exhibited excellent taste and workmanship.

Russia, combining Oriental sentiment and traditions with the art and technical skill of Western Europe, made exhibits of silk fabrics which worthily attracted universal admiration. We refer particularly to the damasks and brocades of silk, gold and silver, the latter literally "cloths of gold and silver," made in Moscow and St. Petersburg, and the sacerdotal vestments in gold and silver tissues made in the same cities. These tissues, vying with the best productions of Lyons in execution, have a characteristic interest and beauty, derived from the traditional splendors of the Greek Church. Some of the rich fabrics were especially noticeable from the pure Byzantine character of the design, employing religious symbols, which Ruskin has pointed out, in his "Stones of Venice," as characteristic of the earliest Christian or Byzantine decoration. The notable exhibitors of these magnificent stuffs were A. & W. Sapojnikoff, Moscow; John Sytof, St. Petersburg; Mosjookhin & Sons, Moscow; and F. A. Jevargeif, St. Petersburg.

The ordinary silk fabrics exhibited by Russia were of high excellence. Among those deserving special mention are Sergius Zoobkof of Khomootovo, Moscow, for rich colored failles; Alexis Fomitcheff, Moscow, for rich figured failles and silk cashmeres; Kondrasheff Brothers, Grebenevo, Moscow, for plain black and colored failles and upholstery damasks; Emilianoff & Rochefort and Zolotaref & Ribakoff, Moscow, for silk and wool dress goods; Shelaief Brothers, Moscow, for black and colored satins.

Mr. A. Néboltine, a Russian statistician, says, "We commenced in the last century to manufacture silk in Russia; but it is only during the present century, and above all since 1830,

under the influence of a protective tariff, that this fabrication has become developed, or acquired any considerable importance." He shows that in 1872 there were 460 silk factories, 15,800 workmen, and an annual production of 10,300,000 roubles; including the production of trans-Caucasia, which is more of a domestic than manufacturing character, and that the importation of foreign silks in 1871 was of a value of 6,293,935 roubles, or a little more than half that of the national fabrication.

Returning to the more prosaic regions of the European silk manufacture, we find that Switzerland best represents the fabrication adapted to the ordinary commercial demands of modern times. Zurich, the chief centre of the fabrication, occupies the same position in the silk manufacture that Bradford does in the worsted and Verviers in woollen industry. She manufactures for export and for the million. Economy of production is the first object. Although provided with very cheap labor, Switzerland has led other nations in the application of labor-saving machinery, and she has chiefly furnished the models for the best machinery used in this country, both in the manipulation and dyeing of silk. She excels in the combination of cheaper materials, such as cotton with silk; the silk being thrown upon the surface, and the cotton forming the back, as in cotton-backed satins and marcelines. Although producing the higher classes of dress silks, black and colored, in great perfection, as evinced in the beautiful exhibit of Baumann, Aelter, & Co., of Zurich, the characteristic of the Swiss manufacture is the adaptation, for popular consumption, of fabrics which are made attractive by taste in design, excellence in execution, and reasonableness of price. An interesting evidence of the confidence of the Swiss manufacturers in holding their own ground against foreign rivals is the circumstance that the Swiss commissioner, alone among foreign representatives, caused a series of albums, most beautifully arranged, containing samples of all the silk products exhibited by his country, to be presented to the principal industrial museums and associations of this country. One of these albums the writer has now before him. In this album, there are no rich brocades, damasks, or velvets, and

nothing conspicuous in an artistic point of view. The fine gros-grains and failles, black and colored, exhibit great regularity and perfection of execution. The figured silks are marked for the simplicity and delicacy of their designs; the fine stripes, so difficult of execution, being perfect. The few brocades are tasteful, but not showy. The marcelines and the satins, with either cotton tram, or chain, are very effective, especially in the materials for cravats. We must not omit a product in which silk, ordinarily ministering only to luxury, contributes to the first of necessities. It forms the material for bolting-cloth used in the manufacture of wheat flour. In the manufacture of this fabric, the Swiss have attained the utmost perfection. The leading exhibitors, with their products, were—

Adlischweil Silk Goods Factory, } Adlischweil, near Zurich, }	Black and Colored Failles and Taf- fetas.
Beumann, Aelter, & Co., Zurich,	Black and Colored Gros-grains and Failles.
S. Rutschi & Co., Zurich . . .	Black and Colored Failles.
Ryffel & Co., Staefa and Zurich,	Marcelines.
Emil Schaerer & Co., Zurich . .	Colored and Figured Dress Silks.
J. Schwarzenbach-Landis, Thal- weil, near Zurich	Colored Failles and Changeables.
Joh. Stapfer's Sons, Horgen, Zu- rich	Plain, Striped, and Check Dress Silks.
Stunzi & Sons, Horgen, Zurich .	Cotton-back Satins.
Baumann & Streuli, Horgen, Zu- rich	Dress Silks.
Jansen, Bodek, & Hertz, Reisbach,	Low-priced Cravat materials.
William Schroeder & Co., Zurich,	Black and Colored Gros-grains and Brocades.
Meyer Brothers, Zurich . . .	Silk Bolting Cloths.
Heidegger, Wegmann, & Co., See- feld, Zurich	Silk Bolting Cloths.
Ruff Huber, Zurich	Silk Bolting Cloths.
Egli & Sennhauser, Zurich . .	Silk Bolting Cloths.
Homburger Brothers, Wetzikon,	Silk Bolting Cloths.

Austria, which more properly should have been considered in connection with Germany, exhibited black silks well adapted from their low price to a large consumption, cotton-back vel-

vets, and silk velvets, black, colored, and white, of excellent manufacture.

The prominent exhibitors were : —

S. Trebitsch & Son, Vienna	Black Silks.
Carl Hetzer & Sons, Vienna	Cotton-back Velvets.
C. G. Hornbostel & Co., Vienna	Fancy Silks.
F. Reichert's Sons, Vienna	All-silk Velvets.
J. Swartz & Son, Vienna	Hatters' Ribbons.

Great Britain failed to make any adequate representation of her manufacture, although it counts by millions of pounds sterling in value. There were only four well-marked exhibits. Pin Brothers & Co. did high credit to Ireland, by a splendid display of their black and colored hand-woven plain silk poplins, which are celebrated throughout the world, and by furniture damasks of fine effect. Norris & Co. made an excellent display of upholstery silks, which were specially noticeable for admirably executed designs, in great variety, all conceived in the spirit of the modern English school. Admirably executed figured and emblematical ribbons were exhibited by Thomas Stevens, of Coventry, as well as an excellent silk loom of quite original construction. There were two excellent exhibits of sewing silks.

Italy, who in the fourteenth and fifteenth centuries supplied all Europe with the richest fabrics of silk, equally disappointed the visitor at the Exhibition by her display of fabrics in this department; only a single exhibit of figured velvets from Milan being noticeable. A series of rich antique stuffs in the Castellan collection, however, gave the visitor some conception of the ancient splendors of the silk fabrication of Italy.

The political condition of Spain prevented her from making the display of which she would have been otherwise capable. Spain is still a treasure-house of the splendid stuffs of the past; most of the richest ornaments of the Kensington Museum having been obtained in that country. We are assured that many of the traditionary arts of silk weaving have been preserved, particularly in the religious houses. Black silks of good manu-

facture, and black cashmere silks in fine grades, well made in every respect, were exhibited; also curtains, furniture damasks, and brocades in good colors; effective stuffs for cravats and fichus, and hand-made figured silks in old Moorish and Oriental styles.

Portugal surprised us by the excellence of several exhibits of gold and silver damasks for church purposes, and of rich brocades and brocatelles for furniture and curtains, as well as well-made dress silks; all evincing an unexpected progress in that country towards industrial independence.

The principal exhibitors and products in the two countries were:—

Spain.

Antonio Pascual & Co., Reus,	
Tarragona	Black Silks.
Farriols & Son, Barcelona . . .	Black Cashmere Silks.
Benito Malrehy, Barcelona . . .	Curtain and Furniture Damasks.
Eduardo Reig & Co., Barcelona,	Silk Cravats and Fichus.
Fenando Ibaniz, Palenciano . . .	Valencia Silks in old Moorish styles.

Portugal.

David José da Silva & Son, Oporto,	Gold and Silver Damasks.
Viuva Ferreira Campos & Co.,	
Oporto	Gold and Silver Cloths.
National Silk Weaving and Spin-	
ning Co., Lisbon	Upholstery Stuffs.
Custodio Lopez da Silva Guima-	
raes, Penafiel	Gold and Silver Galloons and Gimp.
Ramires & Ramires, Lisbon . . .	Black and Colored Failles and Bro-
	catelles.

In observing, as we do in this slight sketch, the high attainments made in silk fabrication by countries regarded as barbaric, as well as those possessing all the modern inventions, we perceive that there are no conditions in any country, where civilization has dawned, preventing the appropriation of this industry. The raw material, unlike wool and cotton, from its high intrinsic value, compared with its weight, being almost as transportable as the precious metals, is almost equally available to every country. Where traditionary skill, which still nourishes the manufacture in the declining countries of the East, is want-

ing, or favorable circumstances, like the exodus of silk workmen into England from the revocation of the Edict of Nantes, do not exist, the encouragement of governments and the enterprise of the people must give the impetus to a manufacture which every self-dependent nation aspires to plant upon its soil. What these influences have accomplished we shall now attempt to trace in the history of the silk fabrication in our own country.

THE SILK CULTURE AND FABRICATION IN THE UNITED STATES.

The exhibits of American silks at Philadelphia were, without question, the most triumphant trophies of achievements in the textile industry within the last two decades displayed by any nation or department of textile fabrication. The brief period within which our silk manufacture has reached its high position tempts us to describe the steps of its progress. But a detailed history would be unsuited to the general plan of this report, while any attempt at original historical research in this department is rendered unnecessary by the full "particulars in relation to silk and the silk manufactures, chronologically arranged, prepared by Mr. Franklin Allen, Secretary of the Silk Association of America," published in the United States Industrial Directory of 1876; and by the exceedingly well written and carefully executed "History of the Silk Industry of America, prepared for the Centennial Exposition by L. P. Brockett, M.D.," and published under the auspices of the Silk Association of America. These works will be freely drawn upon without further acknowledgment. The writer will add that he has verified the observations of Mr. Allen and Dr. Brockett, as well as his own impressions and notes at the Exhibition, by a recent personal visit to most of the representative silk manufacturing establishments in this country.

The Silk Culture.—We will first notice the growth and extension of the silk culture in this country. The production of the raw material was attempted in the earliest periods of our colonial history, in the Southern colonies, where the conditions of climate were most favorable for the growth of the mulberry

and the raising of silk-worms; but the more profitable culture of tobacco and rice, and subsequently of cotton, together with the incapacity of the only working population of the South, the negroes, to perform the delicate operation of reeling, caused the silk culture, in that section, finally to wholly disappear. It was more successful in Connecticut, where the conditions of climate were less favorable, but where the necessities of the people, and their habits of thrift, had developed an active household industry.

Through the influence of Dr. Stiles, afterwards President of Yale College, a State bounty was given, in 1763, for the culture of the mulberry and the production of raw silk. In 1766, half an ounce of mulberry seed was sent to every parish in the State. The domestic culture of silk was very general in the State during and subsequent to the Revolution. It became a fixed industry, however, only in the town of Mansfield, where it had been introduced by Dr. Aspinwall, in 1766. This town became noted for the production of silk grown and reeled in the households. "Mulberry orchards," of the hardy native white mulberry, were distributed throughout the township, and rows of this tree shaded the highways and fringed the cultivated fields. The production of silk in a single family sometimes amounted to one hundred and thirty pounds in a season, and most of the labor was performed by women and children. The silk, very imperfectly reeled, was spun on a hand-wheel into a roughly made sewing silk (dyed in the household), which was usually sold in barter to the country stores. The floss, waste, and pierced cocoons, being mixed with wool, cotton, or flax, were made into coarse stuffs for every-day wear. The domestic production of this town from 1820 to 1831 was of an annual value of not less than \$50,000. In this domestic manufacture, as we shall hereafter see, were the germs of the present silk industry of America.

From 1780 to 1820, the domestic culture and fabrication of silk was also pursued to some extent in New Jersey, Pennsylvania, and parts of New York, Delaware, Maryland, and Virginia, but without any results bearing upon the extension of the manufacture, as in Connecticut.

About the period of 1825, with the growing sentiment (which

then prevailed) for the extension of American industry, the public attention was attracted by means of congressional reports, messages of State governors, and publications by enthusiasts in the press, to the field for American industry which lay open in the silk culture and fabrication. Among the individuals most prominent as writers and practical experimentists, though with no results profitable to themselves, were Mr. Duponceau of Philadelphia, and Judge Cobb of Dedham, Mass. Their appeals found a response in the public mind, dictated by the natural desire to appropriate the most attractive and luxurious of the textile arts, together with a new product for our soil. But the means by which the much-desired industry should be planted were not yet made clear. At an unhappy moment, Dr. Felix Pascalis made known to the public the remarkably rapid growth and supposed excellent qualities of the *morus multicaulis*, first planted in the United States in 1826. In place of the old method of planting the well-known and hardy, but slow-growing, mulberry-trees, it was proposed to secure leaves fit for feeding from trees of a single season's growth, which seemed possible through the extraordinary luxuriance of growth of the multicaulis variety. The public were taught that every farm should be a nursery for the young trees, that every house should have its cocooneries, and that silk would become as cheap as cotton. At first gradually, and then more and more rapidly, the excitement in regard to the multicaulis grew, until it reached a speculation, whose extent and folly, and the ruin it brought in its collapse, in 1839, are too well remembered to need any other notice. With the subsidence of the multicaulis fever, there came a general decline of interest in the silk culture, except in Mansfield, which had so thoroughly tested the value of the white mulberry as to partake but little of the prevalent excitement. There, however, the mania for speculation, which seems to have been an epidemic of the times, was transferred to the white mulberry. The fever had its course and its reaction. Silk culture sank into disfavor in the town to which it had given prosperity for nearly seventy years. Finally, in 1844, a blight of a general character, to which even the hardy white mulberry

yielded, gave the finishing blow, and silk culture in America ceased to exist.

But the silk culture, humble as it was and brief in duration, was the means of developing a knowledge of the fibre, of its uses, and manipulations; it drew attention to the possibilities of the fabrication, and created a passion for working it. The silk culture was the humble larva from which was developed the winged and perfect insect, brilliant with gold and color, to which the perfected silk manufacture may not unaptly be compared.

The Fabrication of Machine and Sewing Silk. — Proceeding to a history of the organized manufacture of silk in this country, we find that two of the most important branches of the manufacture, that of sewing silk and spun silk, were direct offshoots from the domestic silk culture of Connecticut. Attempts were made at Mansfield in 1810, 1814, and 1821, by Rodney Hanks, to manufacture sewing-silk by power, but without success. His grandsons are now successful manufacturers. In 1829, a company, consisting of seven individuals, most of whom subsequently became identified with numerous enterprises in the silk manufacture, was incorporated under the name of the Mansfield Silk Company. Their first successful machinery was made by Mr. Lilly, the promotor of the enterprise, in accordance with the descriptions and rude drawings of Edmund Golding, a young English "throwster," who came to this country at the age of seventeen, expecting to find employment in his art. But the machinery proving inadequate for the manufacture of American silk, as it was then reeled, raw silk for the first time was imported from England and used in the manufacture of sewing silk, which proved superior to the hand-made skeins. From that first successful attempt, the manufacture of sewing-silk, by power, has been uninterruptedly continued, though with successive improvements in machinery, as well as in the quality of the goods made. This company, having unwisely entered into the culture of silk, was finally dissolved. Several members of the disbanded company started the manufacture of sewing silks in other places, and contributed

to the spread of the new industry. An ingenious mechanic of Mansfield, named Rixford, made improvements in the machinery for winding, doubling, and reeling, which were adopted in a mill started at Florence, near Northampton, out of which the now celebrated Nonotuck company's establishment sprung. So that in the humble domestic silk culture of Mansfield may be clearly seen the source of the present manufacture of sewing silks and machine twists in this country, amounting in 1875 to over six million dollars in value.

This is, at present, the characteristic department of New England in the silk manufacture, and the few details which we are able to offer in relation to this branch of silk fabrication can be most appropriately given in this connection. So numerous have the establishments become (twenty-five in Connecticut and Massachusetts, besides those in other States), and necessarily so active is the rivalry between them, that it would be invidious to specialize the several contributions which they have made to the high advancement of this great branch of the silk manufacture.

The first object sought by the early sewing-silk manufacturers was to rival and replace in our markets the Italian sewing-silks in universal use; and the sewings, at first, were put in packages with Italianized labels, simulating Italian sewings. Although dealers had the usual distrust in American productions, our early manufacturers were aided by the long voyages between this country and Europe, which often caused temporary deficiencies in the supply of Italian sewing silks. By filling up these gaps, our manufacturers got their first hold upon the American markets. At first, only colored silks were attempted; competition with the superior black sewings of Italy being considered hopeless. Advancing in the fabrication, and attaining a permanent black dye, through its introduction in 1838 by Messrs. Valentine & Leigh, who had been practical dyers in England, — one of whom, Mr. Leigh, still survives, — they undertook a fabric in greater demand, — black sewing silks in skeins, for tailors' use. The sewing by the hand, and the simple needle then in sole use, demanded a far less perfect thread than

that now required for machine sewing. Illustrations of the solidarity of the industries are perpetually recurring. The American invention of the sewing-machine was the inauguration of the sewing-silk manufacture of America, in the forms and proportions which it now holds. The sewing-machine required that silk for its use, should be put upon spools, and be of a special manufacture. The proprietors of an establishment in Massachusetts, now famous, knowing the difficulties attending the use of silk threads, as then made, upon the newly invented sewing-machine, devised the plan of twisting the silk in a direction opposite to that of common or skein sewing silk. Winding a pound of three-cord silk, thus twisted, upon spools containing one-half ounce each, they submitted it, in 1852, to Mr. Singer, who was then experimenting upon his newly invented sewing-machine, with which he met difficulties that he could not overcome. We cannot so well describe this important step in the manufacture of sewing silks as in the language of Mr. Lilly, a proprietor in the establishment referred to. The silk was handed to "Mr. Singer with the request that he would try it. He put a spool upon his machine, threaded up, and commenced sewing. After sewing sufficiently to enable him to judge of its merit, he stopped, and, after examining the work it had done, exclaimed, 'Can you make any more like this?' (addressing the agent, who stood watching the result with great interest :) 'I shall want all you can make,'—a prophecy literally fulfilled. The new fabric assumed the name of 'machine twist;' and from that time to the present the amount of silk consumed upon sewing-machines is marvellous. A new enterprise was born, which created an industry giving labor to many thousands."

Although, in this first experiment of machine twist, the invention was complete, the manufacturers still found great trouble in its production; for the machine required a thread which, to be moved automatically, must be absolutely perfect, like the machine itself. It was by gradual improvements in machinery, and manipulations generally too minute to warrant description, that they succeeded in the result they have now so completely

attained, — that of placing upon spools a definite weight of silk thread, of continuous length, entirely free from slugs, knots, and uneven places, and perfectly adapted to the machine which is to apply it. We may, however, mention as American inventions, which have contributed to the advancement of this manufacture, new mechanical patented devices for spooling the thread and weighing it; and especially a machine in general use for stretching the thread after it has been twisted, which has the effect of lengthening the thread about fifteen per cent, and of making it even throughout. As the manufacture advanced, the standard of excellence, both on the part of the producer and consumer, grew higher. In the earlier stages of manufacture, the black silks were heavily weighted by chemical means; greatly diminishing the tensile strength of the thread, — a system then invariably pursued by the makers of foreign sewing silks. Certain American manufacturers then introduced goods of strictly pure dye; and, to insure the consumer against fraud, also introduced measuring and strength-testing machines, by means of which the buyer might inform himself of the actual value he had in each pound of twist. In time, the makers placed upon the goods their own names and brands or trade-marks, like the well-known designations, "Nonotuck," "Corticelli," "Lion," "Eureka," &c., which are absolute guarantees, to the consumer and dealer, of the quantity and quality of the goods sold. The direct tests to which the American sewing and machine silks are subjected, in this country, by the ready-made clothing manufacture, unequalled by any other in the world in the extent and systematical character of its operations, has contributed greatly to the perfection of this branch of the silk manufacture. That the United States may now challenge the world in the fabrication of sewing silks was fully demonstrated at the Exhibition, as here before said. All the sewing silks exhibited were subjected to the most severe tests by the expert judges. A result of these careful tests was the conclusion of the judges, that certain American sewing silks exhibited, surpassed, in all the qualities which make up the sum of excellence, any displayed by foreign nations. But the rules of the Exhibition forbade the official

designation in the awards of the particular establishments which won this high honor for the United States.

The statement of the aggregate production of sewing silks and machine twists in this country fails to show the large scale upon which this manufacture is conducted, and the activity of enterprise in this department. A better conception may be formed from the facts, that in a single establishment not less than six hundred operatives are constantly employed, and its consumption of raw reeled silk in the present year is one hundred and three thousand pounds of raw silk of a value of about twelve dollars per pound. As an illustration of the rapidity with which this manufacture has been expanded, it may be stated that a firm of manufacturers who commenced the sale of sewing silks in 1856, with a capital of twenty-five dollars, in 1876 consumed no less than three thousand pounds of raw material in their own manufacture, gave employment to one thousand hands, and sold a value of about eight hundred thousand dollars.

Before leaving this branch of the silk manufacture, we must not omit to notice the machinery in actual operation at the Exhibition, illustrating the methods in use in this country for fabricating sewing silk. A description furnished by an expert correspondent of the "New York Times" is better than any we can offer. The machinery in operation was exhibited by the Nonotuck Company of Florence, Mass., and the Danforth Manufacturing Company, Paterson, N. J. The writer from whom we quote says :—

"To begin with, the skeins of raw silk, just as they come from China or Italy, are strung upon winders, for the purpose of being wound on to bobbins. This is a very simple process, and done on very simple machinery; the only mechanical aid of any consequence being a reciprocating cam, which gives a lateral motion, and distributes the strand of silk equally over the bobbin. These bobbins are then transferred to the 'doubling' machine, on which any number of threads, from three up to ten, are wound together. But this machine involves one or two very pretty movements. As in the case of the winder, the equal distribution of the combined thread on the bobbin is regulated by

a reciprocating cam; but a very neat attachment also stops any one bobbin the moment one of the threads, making the combined thread, snaps. Immediately under the bobbin on which the threads are jointly wound there is an arm rising from a balance-frame. Should one of the threads snap, the guide, through which it runs, and which is only supported by its tension, falls back against the balance-frame. Its weight is sufficient to displace the frame and bring forward the arm; and the arm, having an elevation, raises the bobbin and unships it, at once stopping its revolution. By this ingenious arrangement, the main thread is kept of one continuous size without any trouble, because it cannot run on without the companionship of all the minor and component threads. On being taken from the doubling-machines, the bobbins are placed on the 'spinner,' which gives the various threads a sufficient spin to make a strand in the process of unwinding. The bobbins then go to the 'twisting' machine, on which the threads from three of them are firmly spun and twisted together to make what is called machine-twist silk, but from only two bobbins to make sewing-silk. Both kinds of silk are twisted twice, but with this great difference: machine twist is first twisted to the right, and then to the left; while sewing-silk is first twisted to the left, and then to the right. The silk is then rewound into skeins; and, after being washed in strong soap suds, is dried and stretched. The length of these skeins is regulated with great nicety by an ingenious adjustment. An eccentric drives a ratchet wheel with a dog on it; and the adjustment causes the dog to strike the shipper and stop the winding machine the moment the desired length of silk has been wound into the skein. The silk is now ready for the dyer, and, after being dyed, is again wound in bobbins preparatory to 'spooling.' The spooling machine has a feed shaft with a right and left hand thread on it, and a half nut on either side. This arrangement gives an easy and regular direct and reverse lateral motion to the guide, the spool remaining stationary; the length of silk wound on to the spool is regulated by a binder and a strap attached to a weight, both being governed by a treadle. The operator knows exactly how many times the guide should travel right and left to fill the spool. By pressing the treadle, the weight below the shaft is raised, and releases the strap from the shaft; while at the same moment, and equally governed by the treadle, the binder (which is a small wheel) presses the belt against the shaft, causing it to revolve. The moment the spool is full, the operator ceases to press the treadle, the binder releases the belt, and the strap, attached to the weight below, falls on the shaft and stops it instantly. The same arrangement

enables the operative to stop the revolution of the shaft in case of accident to the spool or thread, as the machine cannot run unless the foot is pressing on the treadle; and, the moment the pressure ceases, the machine comes to an instantaneous stop. One of these spooling machines will wind one hundred and ten dozen of spools a day; and some conception of the extent of the Nonotuck Company's business may be gained from the fact that they have no less than sixty of these spooling machines in constant operation in their factory, where they employ over six hundred hands. Only one thing has to be done to render the spools ready for the silk: it is to stamp their two ends with the brand and the name of the company. This is done by one of the prettiest and most perfect little pieces of machinery in the hall, and the stamping of the colors into the wood obviates the falling off of printed labels, as is sometimes the case with cotton spools from insufficient gumming in the labeling machine. The spools are fed from a trough, through a hollow post, into the stamping machine; an arm pushing them one by one, as they come out at the base of the post, into a groove, where they are caught and held in position by a small weight, the spool at the same time pushing back a spring. Two spools are in the grooves at one time; the one receiving its first and the other its second stamping simultaneously. At either end of the spools are two dies, one inked with red and the other with blue ink. These dies press upon the spools simultaneously; impressing the name of the company in one color, and, on the second impression, the brand in the other color. The outer spool is then released by the momentary rising of the weight, and the spring against which it was pressing kicks it out into a basket. The groove bed revolves, bringing the inner spool to the outside and a new spool into the place of the inner one; the operation being repeated *ad infinitum*. As the dies spring back from the spools, they take a quarter turn upward, which brings them under the inking rollers; the rollers being inked and moving in a similar manner to those in a job-printing press. There are four composition rollers to each ink reservoir and pair of dies. The whole stamping machine is divided into two parts, each the counterpart of the other; and turns out the stamped spools at the rate of one hundred and twenty a minute. One machine will stamp seventy thousand to eighty thousand spools a day, sufficient to fill ten ordinary flour barrels. When wound on the spools, the silk is ready for the completion of orders, or to go into stock in the warehouse."

The Fabrication of Spun Silk. — It was in the silk culture

that the largest and most celebrated of our manufactories of silk goods, that of the Cheney Brothers, had its birth. As this establishment is wholly without rivals in its special department, and one of the most characteristic in the whole range of the American textile industry, it commands a special mention which would be invidious in other branches of the silk fabrication.

The sons, eight in number, of a farmer in South Manchester, whose original dwelling is sacredly preserved in its pristine simplicity under the endeared name of "the homestead," after the custom of the town had cultivated mulberry-trees and raised silk-worms in their boyhood. Some remained at the old home, while others were scattered, but only to return. For four or five years previously to 1838, four of the brothers had been raising silk-worms and producing silk, like their neighbors. In that year, they started a small silk-mill at South Manchester, for the purpose of making sewing silk. Their increasing interest in the silk culture, however, led them to suspend the operations of the mill for a time, when three of the brothers removed temporarily to Burlington, N. J., where they established nurseries and cocooneries, and published a magazine known as the "Silk Grower's Manual." Their energy having, however, been mainly devoted to planting nurseries of the multicaulis, and their plans having been frustrated by the explosion of that bubble, in 1839 they returned to their forsaken mill at South Manchester, and resumed the work of making sewing silk from imported raw silk. Subsequently, they were rejoined by others of the family, who had established mulberry plantations in Florida and Ohio. We do not propose to follow the steps by which this establishment reached its present vast expansion. Success came slowly, and after many discouragements, and with it an enlargement of their operations. In 1854, a mill was built in Hartford. Buildings were added at South Manchester, new machinery and methods invented and imported, while new branches of manufacture were added to that of sewing silk. The main feature of the manufacture in time came to be the working into every conceivable fabric that form of silk known here as spun silk, and on the continent of Europe as *chappe*.

This is silk spun from pierced cocoons, floss, and waste, and whatever cannot be reeled. The fabrics from this material, though wanting in the high lustre of those made from reeled silk, are remarkable for their wearing qualities, their beauty actually increasing with wear. The exclusive use of this material for dress goods and ribbons is quite recent; but these fabrics, as now made by the Messrs. Cheney Brothers, are recognized as cheaper and better than any goods of their grade in the market. The leading articles produced in this establishment are black and colored gros-grain silks, which have obtained a wide-spread reputation for their cheapness and good wearing qualities, as compared with imported goods of corresponding grades and weight. Ribbons of all colors and widths, which are among the most popular brands in the market, and a great variety of silks for the millinery and trimming trade, — for parasols, and for hat and fur linings. The expert judges at the Exhibition recognized in their award to Messrs. Cheney Brothers the "high degree of excellence of the piece goods and ribbons exhibited, and the perfect manipulations of the spun silk in every form."

But the proud distinction of this establishment is not so much the unequalled character of the fabrics in its peculiar line, its army of fifteen hundred workmen, or its production, exceeding two millions in annual value, as the manner in which it has solved the highest and most difficult of problems, — the securing commercial success, with the harmony of interest between the employer and the operative. It would seem that neither taste nor social science could devise happier adaptations for the wants of a manufacturing population than are found in the village of South Manchester. In a highly kept park of seven or eight hundred acres, without a single enclosure, are scattered the beautifully appointed factories and warehouses, the handsome residences of the proprietors, the churches and public halls, the convenient boarding-houses, and the two hundred dwellings of the workmen, each isolated, with a pleasant garden plot, and provided with water, gas, and perfect sewerage. The large farm of the proprietors, near the village, furnishes a supply of milk and vegetables at moderate prices; and an

extensive bakery contributes to the public convenience. The intellectual wants of the workmen are provided for by a first-class school, a library and reading room, and a commodious hall for lectures and public entertainments. The dream of an ideal community seems here to be as completely realized as is possible with the inexorable conditions of labor and capital. It is gratifying to see that the enlarged views of the proprietors have been productive of commercial success. An obvious result of their system has been to secure and retain the best class of workmen. There has never been a strike in this establishment; a strike being held, in the words of one of the proprietors to the writer, "as disgraceful to the employer as to the operative."

Woven Goods of Reeled Silk. — To observe the American fabrication of silk in its most luxurious forms and in the utmost variety, we must leave New England, and seek a district in New Jersey and New York, comprising the city of Paterson, its chief centre, and outlying establishments in Brooklyn, Hoboken, and New York City. In this district, and particularly in Paterson, lying about twenty miles by rail from the great metropolis, may be seen, in successful activity, nearly every form of silk fabrication pursued in Europe. It is a law of the development of industries that they spring from some obscure germ, as the tree grows from its seed. Like the sewing-silk and the spun-silk manufacture, the magnificent industry of Paterson grew out of the silk culture of Connecticut. It was founded by Christopher Colt, Jr., whose father was a president of a Connecticut silk-manufacturing company, which existed from 1835 to 1839, and an enthusiast in the silk culture. An uncle of Christopher Colt, Jr., was the inventor of the celebrated revolving pistol, and had built a large factory in Paterson, then a village of about seven thousand inhabitants, for the manufacture of his pistols. He offered the fourth story of his mill, with power to drive machinery, to his nephew Christopher, for the establishment of a silk-mill. It was supplied with machinery and started; but at the end of three months it was

closed, and the stock, machinery, and fixtures were offered for sale. Happily at this time, namely, in 1839, John Ryle, of Macclesfield, England, who had learned the arts of the silk manufacture in his native town, was attracted to this country by the glowing statements sent abroad by the promoters of the *morus multicaulis* excitement, then at its height. He visited Northampton and Connecticut, witnessed the collapse of the multicaulis bubble and the extinction of the silk-manufacturing establishments which had embarked in the speculation, but only to be more vividly impressed as to the field which lay open in this country for silk manufacture. Imparting his enthusiasm to a Mr. Murray, a capitalist, whom he fortunately met at Northampton, the latter was induced to buy out Colt's machinery, and place Mr. Ryle in charge of the first successful silk-mill in Paterson.

In 1843, Mr. Ryle having become a partner with Mr. Murray, the firm employed fifty hands, and consumed eight thousand pounds of raw silk per annum, in the production of tram, sewing silk, and twist. In 1846, Mr. Ryle was assisted by his brothers in England to buy out Mr. Murray's interest, and, being sole owner of the establishment, set some looms at work, and produced several pieces of dress silks. But this fabrication was not continued. In 1857-58, he employed from four to five hundred operatives, and consumed two thousand pounds of raw silk per week. For twelve years he was without any competitor in Paterson. His first successful rivals were Messrs. Hamil & Booth, who commenced business in Paterson as throwsters, in 1854, with twenty operatives, but who now give employment to nine hundred. Even as late as 1862, the manufacture of silk at Paterson was mainly restricted to the making of machine twists, sewing silks, and tram silks, for the use of manufacturers of silk trimming located in other cities. Efforts were made, in the years 1846, 1849, and 1864, to introduce the weaving of broad silks; but the experiments were only successful in demonstrating the skill of manufacturers, the popular prejudice against American products then forbidding the profitable introduction of these silks.

The writer has been careful, in these reports, to avoid any consideration of the vexed question of free-trade and protection. But the coincidence of the tariff of 1861 (which largely increased the duties on imported silks), and the tariff of 1864 (making a still larger increase of protective duties), with the establishment and growth of silk weaving in this country, is a fact which cannot be overlooked. In 1862-63, material improvements were made by the machinists of Paterson in the construction of the silk-spinning machinery required for the fabrication of fine trams and organzines, the yarns necessary for weaving broad silks; and a greater uniformity was attained in assorting the various sizes of yarns required for weaving, which was effected by the introduction of the processes known as *deniering* and *draining*.

In the mean time, the command of the domestic market, assured by the tariff of 1861, encouraged manufacturers in Baltimore, and Williamsburgh, N. Y., to embark in the weaving of ribbons, scarfs, neckties, &c. The establishment at Williamsburgh was transferred, in 1867, to Paterson; and, under the name of William Strange & Co., now employs eight hundred operatives, turning out an annual product of ribbons of the value of over a million of dollars. There are now eight ribbon manufacturers in Paterson, and the production of this single city is over one hundred thousand pieces of ribbon per month.

The permanent establishment of broad-silk weaving in Paterson dates from the period of 1866. It was first successfully effected there by the Phœnix Manufacturing Company, and was made successful through the production of the yarns before referred to. This establishment now employs nine hundred operatives, and is distinguished for its perfection in Jacquard weaving. At first, eighty per cent of the broad silks made was used for ladies' ties. In 1872, other firms entered into broad-silk weaving. The increase in the number of looms was followed by variety in production, until, as at present, there is scarcely a product of European looms in millinery, and even the highest class of dress silks, which does not find its rival in the Paterson factories.

The command of skilled labor, the admirable water-power, the vicinage to the metropolis, and, above all, the well-known advantages of centralizing the manufacturers in a special department of a textile industry, have led several important silk manufacturers, first located in Boston, Williamsburgh, Schoharie, N. Y., and New York City, to transfer their establishments to Paterson. This competition, instead of being injurious, has given an impulse to the original manufacturers; as illustrated in the operations of the simple throwsters of 1854 with twenty operatives, before referred to, who now employ nine hundred workmen in the highest forms of silk fabrication.

A prominent advantage of centralizing manufacturing establishments is the opportunity given for specializing certain departments of industry. This is shown at Paterson in the great success attained in an essential branch of the silk manufacture, — that of dyeing. The concentration of silk manufactures at this place has produced the largest and most perfectly appointed dyeing establishment in the country, in which a large part of the fabrics produced in Paterson are dyed on commission. The proprietors of this establishment, Messrs. Weidmann & Greppo, educated in Europe, and related to eminent dyers in Lyons and Switzerland, have introduced the best processes and machinery known abroad. One group of machines just introduced for *stringing* and *shaking* the yarns, for the purpose of straightening and stretching them after being dyed, does with three or four men what formerly required the severe labor of sixty stout men. Their relations with Lyons and Zurich keep them promptly informed as to the latest improvements and fashions. Their exhibit of dyed silks was one of the most attractive, and that of black weighted silks was one of the most instructive, at the Exhibition. Four years ago, the dyers of Paterson held that it was impossible to perfectly dye pure black silks in their establishments, on account of supposed defects in the water of the place. A dye is now given in black dress silks fully equal to the celebrated black dyes of St. Chaumont, near Lyons. The American dyers of black silks refrain from the reprehensible practice of European manufacturers of heavily

weighting their black silks by means of chemicals. It is said that the average of French black silks are weighted as high as one hundred per cent. The weighting may be carried, without detection by the eye, as high as three hundred per cent; but very brief wear reveals the deception. It is by no means claimed that there is higher morality on the part of American manufacturers. But the sins of the producer for a domestic market fly back to him so promptly and certainly, in the form of reclamations, that interest alone compels honest fabrication.

"Dyeing," said the immortal Colbert, "is the *soul* of tissues, without which the body could scarcely exist." This is especially true of silks: the attainment of the arts of perfect dyeing is the overcoming of the last obstacle to a successful manufacture. Fashion, constant only in change, is perpetually varying her demand for new colors, hues, and tones. She is inexorable even as to the most delicate shades. A ribbon or dress silk may become absolutely unsalable, at any moment, by a change of fashion. Hence the advantages which Paterson enjoys in the perfection of her dyeing establishments, and of a taste instructed by a vicinage to the great metropolis. The taste of the present times, it may be observed, demands the almost exclusive use of aniline dyes in colored silks. They are more vivid and enduring on silk than on any other raw material, and, though still comparatively fugitive, are no more so than the fashions. Black, brown, and drab are almost the only colors for which anilines are not used.

To recur to the more general features of the silk industry of Paterson. Its importance is shown by the facts obtained from the report of its Board of Trade of 1876: number of operatives, eight thousand; amount of silk used each week, nine thousand pounds; number of ribbon manufacturers, eight; number of broad-silk factories, six; and about one hundred and fifty hand-looms, worked by men in their own homes. Most of the spinners use their own silks. The average wages of men weavers per week, fifteen dollars; women and boys, seven dollars. The value of the total production yearly is about six million dollars.

We have dwelt at length upon the silk industry of this city, because it is representative of its class. Important manufac-

tories of woven silks, broad goods, and ribbons, are found in West Hoboken and Union, in New Jersey, and in New York City: such as those of Herman Simon, in Union; Givernaud Brothers, in West Hoboken; John N. Stearns & Co., and J. Silbermann & Co., in New York City, &c. All the silk manufacturing establishments of New York and New Jersey, including those of Paterson, may be said to be manufacturing appendages of the city of New York. The manufacturers nearly all have their warehouses and partners in the city, or visit it daily, and the goods are despatched each day to the city sale-rooms. Some were originally importers of silk goods; others still continue importing in connection with their manufacturing operations. Thus a knowledge of the wants of the trade, of the changes of fashions, of the coming styles, is secured, which would be unattainable except through the influences of a great metropolis. That importers should become domestic manufacturers is a tribute to the excellence of home manufacture. The papers of the day furnish a significant tribute of this kind, in an advertisement of the great importing firm of A. T. Stewart & Co. of American silks of their own fabrication in the city of New York.

A few words may be given to some of the improvements made in the silk fabrication, which may be observed in the centre of manufacture now under review. Machinery for throwing has recently been introduced at Paterson, by which a spindle which formerly made three thousand five hundred revolutions per minute now makes seven thousand, doing its work as well as that more slowly revolving. It is claimed that these machines, some of which contain nearly seven hundred spindles, are capable of producing double the amount of work per spindle that can be done with the largest European frames; and that they can be managed by two attendants, one on each side. Winding, which ten years ago cost by piece-work one dollar per pound, costs now forty-five cents; the girls earning more than at old prices before the improvements. A new Swiss machine, just introduced, reduces the cost of warping from ten cents to five cents. The old machines, moved by hand, contained eighty bobbins; the new one, moved automatically,

contains three hundred. A new loom for weaving hat ribbons makes two hundred and fifty shots in a minute: each loom is independent, making from thirty-six to fifty yards per day, and one girl tends eight looms.

But the most notable improvement is the absolutely successful achievement of weaving the very highest class of dress gros-grains, black and colored, by power. This has been accomplished by the Messrs. Simon, at Union, N. J., about fifteen miles from Paterson. Mr. Simon, educated as a civil engineer in the technical schools of Europe, has combined the various improvements observed by him abroad and in this country into an automatic loom; upon which, with the attendance of a boy of twelve or fourteen years old, sixteen yards of broad gros-grain silks may be woven per day, — the cost being eleven cents per yard. The production of eighty looms in this establishment has this average. We are assured that no first-class goods are woven abroad by power. These goods can therefore be made more cheaply here than at Lyons. These looms, with their products, won the admiration of our associate, Mr. Gebhard, who remarked "that he had never seen such goods made upon power-looms, and had no idea that such work could be performed automatically."

Silk Bruids, Trimmings, and Laces. — This department of the silk manufacture employed in 1876 two thousand seven hundred and fifty-three operatives: more than three-fifths were women. The founder of this branch of industry in the United States — if, indeed, he may not claim to be the pioneer of the industry as a whole — was William H. Horstmann, who, having learned the trade of silk-weaving in France, established himself in Philadelphia, in 1815, as a manufacturer of silk trimmings. In 1824, he introduced from Germany the use of plaiting or braiding machines; and, in 1825, the use of the first Jacquard loom employed in this country. By means of the various improvements introduced by him and his successors (his sons and grandsons), the house of William H. Horstmann & Sons has become one of the largest in the silk manufacture now exist-

ing in this country. Its vast warehouses and sale-rooms in Philadelphia bewilder the eye with the number and variety of its fabrics; including, indeed, the whole range of narrow textile fabrics, — bindings, braids, fringes, dress trimmings, coach and military equipments, theatrical goods, gold and silver laces, and embroideries. Two other large houses in Philadelphia, viz., J. C. Graham and Hensel, Colladay, & Co., vie with the older house in the production of this class of goods. Their houses were established about 1850. These manufacturers have most contributed to give Philadelphia its reputation as the chief seat of the general manufacture of trimmings in the United States. In New York, the present house of J. Maidhoff & Co. was established in the manufacture of dress trimmings in 1849. In this city, Louis Franke is also prominently identified with the manufacture of silk fringes, cords, and tassels. In Connecticut, Tobias Kohn, of Hartford, now President of the Novelty Weaving and Braid Works, established the manufacture of gimps, fringes, and tassels, as early as 1848. An expert in this department of the silk fabrication observes that "the home manufacturers so fully supply the demands for the dress-trimming trade that there are very few colored dress and cloak trimmings imported. The variety of patterns for sale at the trimming stores is so great that ladies find no difficulty in perfectly matching the color of their dresses. While thus meeting all the requirements of taste, the American fringes and trimmings are in general of the best material. Being made of pure silk, they will usually outlast the garment they ornament. They contrast in this respect with imported goods of similar appearance, but made from inferior silk, and hence apt to fade by exposure, or to wear out and fall off. Greater care in the processes by which they are made has also contributed to the notable superiority of American trimmings."

The manufacture of silk laces by means of the most modern and approved European machinery has been undertaken on a large scale, with high success, by A. G. Jennings, of the Nottingham Lace Works, Brooklyn, N. Y; the machines made in England having cost over one hundred thousand dollars.

The products of the works are principally silk guipure laces, and black thread and silk blonde laces for trimmings, Brussels spot-net and grenadine veilings, silk purling for trimmings, and silk-lace ties and scarfs. It is claimed that the lace goods are superior to those ordinarily imported, from being made of pure silk. The exhibit of these goods at Philadelphia received an award for excellent fabrication, and for "illustrating an important manufacture just introduced into the United States by the exhibitor."

General Observations. — Having considered the characteristics of the three leading departments of the silk manufacture in this country, our remaining observations must apply to the industry as a whole. It cannot be denied that the silk manufacture in this country enjoys some high advantages. The raw material is free of duty; and can be obtained, certainly, as cheaply by the American as by European manufacturers. Indeed, the former have often the advantage of obtaining at low prices the surplus stocks of Europe. The protective duties on silk manufactures encounter but little popular prejudice, as a revenue is thus obtained by taxing articles, principally of luxury. Our silk manufacturers have of late received very favorable consideration from the revenue committees in Congress, who have responded to all their reasonable demands. They thus benefit by an ample and wisely arranged protection. That is much less, however, in fact than it seems to be, — sixty per cent — as the silk manufacture peculiarly suffers from foreign undervaluations, estimated to be as high as thirty-three per cent, making the actual protection not higher than forty per cent. It is asserted that the higher protection given by the tariff of 1864, viz., an increase of twenty per cent, has not increased the prices of goods to the consumers; the increased competition having actually made the prices of goods lower under the increased tariff. The silk industry, although subject to the high cost of labor, rates of interest, and local taxation, which bear so heavily upon all manufactures in this country, has been benefited by the arts and inventions matured by our older textile industries,

and by the general perfection of machinery secured by our patent system. It is believed that, as a whole, our silk machinery, in efficiency, is equal, and in some respects superior, to that abroad. As to our fabrics, first in acknowledged excellence are our machine twists and sewing silks, articles of first necessity in the manufacture of boots, shoes, and clothing, and in the household economy of every home. The machine twists are produced of such quality and at such prices as entirely to prevent the importation of foreign twists, and sewing silks are imported only to satisfy the lingering prejudice against domestic productions. Our spun-silk fabrics have no foreign rivals, in quality and prices. In ribbons, we supply two-thirds of the demand of our own market, and in plain goods can fairly compete in quality with the products of St. Étienne. In trimmings, even with their infinite diversity, there is no article made abroad which is or may not be reproduced here. In broad silks, each of the last five years has seen the achievement of some new fabric, advancing from millinery to dress silks, overcoming all the difficulties of Jacquard weaving, and thence to brocade and damask silks. Our manufacturers have in the last year seen accomplished, on a large scale, the fabrication of colored and black gros-grain dress silks, which are pronounced, not by the makers but by rival manufacturers, to be absolutely equal in quality, while cheaper in price, to the very best imported silks. We are still, however, far from the position in the silk manufacture to which we should aspire. In the higher fabrics, we are wanting in originality and a national character of design. The widest field for artistic work, that of the fabrication of upholstery stuffs, is almost wholly unexplored. We have made no bolting cloths, have done but little in velvets, and still allow the silk plushes for hats (so enormously consumed here) to be made abroad. With all the excellences of our machinery, we are too dependent upon foreign workmen for skill in manipulation. Technical and art schools which shall develop native taste and skill, can alone give a national character to the higher fabrics of this industry.

These general observations cannot be more appropriately

closed than by a summary of the American production as furnished by that model industrial institution, — the Silk Association of America : —

VALUE OF PRODUCTS, CLASSIFIED BY ARTICLES, MANUFACTURED IN THE YEAR ENDING DEC. 31, 1876.

	Pounds.	Value.
Tram	369,182	\$2,768,490
Organsine	184,567	1,614,961
Spun Silk	140,000	805,000
Fringe Silk	88,862	208,172
Floss Silk	5,488	35,428
Sewing Silk	82,895	951,460
Machine Twist	468,916	6,801,059
Dress Goods		1,350,535
Millinery and Tie Silks		1,679,166
Women's and Men's Scarfs		119,946
Handkerchiefs		927,000
Foulards		472,000
Ribbons		4,528,556
Laces		220,000
Coach Laces		24,500
Veils and Veiling		16,518
Silk Hose		8,200
Braids and Bindings		315,000
Military Trimmings		28,000
Upholstery Trimmings		526,036
Ladies' Dress Trimmings		3,705,076
Total products, 1876	1,284,860	26,598,108
	Pounds.	Value.
Reeled Silk consumed	1,144,860	\$11,874,570
Spun Silk consumed	140,000	805,000
Total Silk Threads	1,284,860	12,679,570
Consumed in sewings and twist	551,811	7,252,519
Consumed in weaving	733,049	\$5,427,051
		\$18,918,538

The American Exhibits of Silk. — Although much material furnished by the Exhibition has been incorporated in the preceding pages, the features of the display of products of the silk industry at the Exhibition demand a special notice.

The position accorded to the American silk exhibits was an exceedingly advantageous one. Instead of being thrust on one side or into a corner, it had the post of honor at the east end

of the Main Building, on the central aisle; and thus naturally attracted the first attention of the visitors who made a systematic survey of the Exhibition. The show-cases in which the goods were displayed exhibited the good taste so peculiarly requisite in this industry. Although various in construction and ornamentation, there was a general resemblance, which gave agreeable unity to the display. Inside the cases, some of the goods (as those of spooled silk) were arranged in architectural devices, giving the effect of towers, domes, and arches. In others, the richness of fabrics alone sufficed to give brilliancy to the displays. The arrangement of the dyed silks so as to give prismatic effects was peculiarly attractive. No visitor could fail to feel, that, if this exhibit had been wanting, the American display of textiles would have lost its chief charm, and American patriotism one great source of its complacency. In Machinery Hall, and in the Women's Pavilion, different processes of the silk manufacture were illustrated, on a large scale, by several different manufacturers. The actual operations of reeling, twisting, spooling, and weaving, — in some cases by the Jacquard attachment, — gave delight and instruction to curious throngs. The newest American machinery, — especially the "two-decker" spinning-frame, constructed by the Danforth Locomotive and Machine Company, containing winder, doubler, spinner, and reeler in one — attracted the admiration of experts.

These exhibits were equally surprising to foreign visitors and our own people. High tributes to these exhibits have already come back to us from abroad: the French publicist, Jules Simonin; the Swiss Commissioner-General at the Exhibition; and a well-instructed writer in a paper published in Macclesfield, the head-quarters of the English silk industry, — having pointed out the exhibits at Philadelphia as proofs of the competition which their countrymen must expect in this country.

Having given the names of the principal foreign exhibitors in this department, we cannot do less for our own countrymen. In describing the exhibits, to avoid any possibility of error, the writer has adopted substantially the language of the official

awards. The exhibitors are grouped according to the departments they pursue; and are named irrespectively of merit, — no numerical scale of excellence being admitted by the rules of the Exhibition: —

- J. H. HAYDEN & SON**, Windsor Locks, Conn. — Slack and medium twist, of great brilliancy, strength, and regularity.
- M. HEMINWAY & SON**, Watertown, Conn. — Machine and sewing silks, perfect in quality of material, color, and workmanship.
- HOLLAND MANUFACTURING CO.**, Willimantic, Conn. — Machine twist and sewing silks; highly meritorious for the excellent quality of raw material, and the preparation for the various purposes.
- SEAVEY, FOSTER, & BOWMAN**, Boston, Mass. — Sewing silks, of great uniformity and general excellence.
- BELDING BROS. & CO**, Rockville, Conn. — Machine and sewing silks, of good color, strength, smoothness, and quality.
- ACB, HACKENBURG, & CO**, Philadelphia, Pa. — Sewing and embroidery silks, meritorious for great beauty and brilliancy of color; button-hole twist and saddler's silk highly commendable.
- NONOTUCK SILK COMPANY**, Florence, Mass. — Sewing silks and machine twist; great superiority as to strength and regularity, evincing extreme care in the manufacture.
- S. M. MEYENBERG**, Paterson, N. J. — Millinery silks and upholstery satins, of superior quality and finish; ladies' scarfs of excellent color and design.
- JOHN N. STEARNS & CO.**, New York City. — Brocade silks, of superior styles and quality; twilled silks, well made, and meritorious in every respect.
- DEXTER, LAMBERT, & CO.**, Paterson, N. J. — Millinery silks, well made, and of good colors; brocade silks, of excellent manufacture.
- CHENEY BROTHERS**, Hartford and South Manchester, Conn. — Spun silk, in every form, perfectly manipulated; piece goods and ribbons made thereof, evincing a high degree of excellence.
- NEW YORK WOVEN LABEL MANUFACTURING CO.**, New York. — Woven silk labels and *fac-simile* of signature of Declaration of Independence, of good execution.
- FREDERIC BAARE**, Paterson, N. J. — Black figured silks, made in an improved and superior manner; millinery goods, of good manufacture.
- HAMIL & BOOTH**, Paterson, N. J. — Figure, dress, and millinery

silks, plain satins, serges, and silk ribbons, of excellent manufacture and material.

WERNER, ITSCHNER, & Co., Philadelphia.— Faille, fancy, and Jacquard ribbons, of very good manufacture both as to color and combination of material.

B. B. TILT & SON. — Brocade silks and handkerchiefs, of superior quality and workmanship.

WILLIAM STRANGE & Co., Paterson, N. J. — Plain and fancy ribbons, of good materials, well made in every respect ; silk and millinery ribbons of great beauty and superior quality.

LOUIS FRANKE, New York. — Silk fringes, dress trimmings, and tassels, of the best material, excellent in style and manufacture.

SUTRO BROTHERS, New York. — Braids of great regularity and excellent manufacture.

DALE MANUFACTURING COMPANY, Paterson, N. J. — Silk and mohair braids, fancy cords and trimmings, of great beauty and excellent workmanship.

WILLIAM H. HORSTMANN & SONS — Dress, carriage, and upholstery trimmings, of great excellence and beauty in style, material, and execution.

A. G. JENNINGS, Nottingham Lace Works, Brooklyn, N. Y. — Guipure, cashmere, and other lace and trimmings and net goods, of excellent fabrication.

WEIDMANN & GREPPO, Paterson, N. J. — Black and colored dyed silk, compares well with the production of the best European establishments.

Exhibits of American Cocoons and Raw Silk. — Although we have waived the consideration of the foreign products of raw silk, the only two American exhibits of this material were so interesting and instructive that they deserve an extended notice. While the silk culture has ceased in all the older States, it has recently been attempted, with sanguine hopes of success, in California and Kansas.

The planting of mulberries for the feeding of silk-worms was first undertaken at San Jose, California, in 1856, by M. Prevost, a botanist from Normandy, France ; but the public attention was then so occupied with gold mining that the trees were unsalable, and M. Prevost abandoned their culture. A small number of trees was also planted by a Swiss gentleman, —

M. Mueller, of San Jose, — who, in 1861, imported a few silk-worm eggs. The worms raised were fed upon the trees before planted, and the results obtained were so excellent as to revive the interest of M. Prevost, who recommenced the planting of mulberries and raising of silk-worms, which he continued until the time of his death, in 1869; he having in the mean time distributed silk-worm eggs, gratuitously, to persons in various parts of the State. The interest in sericulture became thus so general in the State that the legislature of California provided by law that a bounty of \$250 should be paid for every 5,000 newly planted mulberry trees, and \$300 for every 100,000 cocoons produced in California. The object of the law was defeated by the planting by speculators, for the bounty, of several millions of the worthless multicaulis mulberry, and the law was repealed. In 1866, Mr. Joseph Neumann, of German birth, imported machinery for the fabrication of silk, and invented a reeling-machine for winding the raw silk from the cocoons. In 1867, he reeled the first skein of raw silk produced in California. In 1869, he produced 130 pounds of raw silk, and made from it two large flags, — one of which he presented to the State, and the other to the National Government. Meeting, like most pioneers, with but little commercial success in the attempts to manufacture silk, he finally abandoned the fabrication for the production and reeling of raw silk. His very large exhibit of cocoons and raw silk, and his exhibition of worms feeding and in different stages of growth, attracted great interest, and received from the expert judges the following award: "A very good collection of cocoons and raw silk, of a variety of races, highly commendable for the successful attempts in the introduction of this important branch of industry."

The statements made by Mr. Neumann to the judges, in regard to inducements for sericulture in California, were so interesting and important that they deserve a wider publication.

He regards California as better adapted for the silk culture than almost any country in the world. He said, in regard to climate, that —

"The mulberry-trees in most parts of the State grow ten months in

the year (from February to the end of November) ; so that worms can generally be fed uninterruptedly. Spring, summer, and fall are uncommonly dry, consequently the food of the worms is dry. The mulberry-tree throws out new branches and leaves four times a year. and worms can be fed from the fifteenth day with branches. In some localities in California trees five years old surpass those of fifteen years in Europe. The leaves are much larger, also, and one can gather six or eight times as much as in Europe in the same time. Thunderstorms do not occur during the feeding season, and the worms consequently are not disturbed. The dryness of our atmosphere prevents the remains of the leaves which the worms do not consume from decaying, and the beds need not be cleaned more than twice in a season. We have proved that the cocoons enlarge from year to year."

In Kansas, sericulture has been attempted by E. V. de Boissiere, a French gentleman of means, who has set his heart upon surrounding his chosen home with a colony of operatives employed in the silk culture and manufacture. He has built a mill for the manufacture of silk goods, and is confident that the silk to supply it will be produced in his neighborhood. His exhibits of raw silk and cocoons at Philadelphia were conclusive as to the favorable influences of the soil and climate of Kansas for sericulture. The remarkable character of the cocoons exhibited by M. de Boissiere so much impressed Mr. le Boutillier, one of the American judges of silk in Group IX., that he requested Mr. Hayami Kenzo, of Japan, a member of the group specially expert in raw silk, to give him his personal observations. Mr. Kenzo thus replies, in a note to Mr. le Boutillier, now before the writer : —

" Having examined the cocoons from Kansas, we marked them as good as the best cocoons from France, Italy, and Japan. Having a doubt as to the correctness of our judgment, I looked them over again with great care, and came to the same conclusion as we had before. I suppose the mulberry-trees are cultivated in very rich soil, and, being not so old, are especially suited for feeding silk-worms. The chrysalids are large and healthy, and several have been almost entirely transformed into butterflies. The best silks in good weights will be obtained from these cocoons."

It is obvious that a protective duty on raw silk for the general encouragement of sericulture in this country would not be justified. The culture offers no prospects of success, except in a few favorable localities; and a duty on the raw material would be oppressive to the manufacture. The question of encouraging the silk culture by legislative provisions addresses itself only to the governments of the States which are specially adapted by soil and climate to this culture. The American judges in Group IX. were so impressed by the exhibits and facts presented by Mr. Neumann and M. de Boissiere, that they were prepared to indorse memorials which might be addressed by these gentlemen to legislatures of their respective States asking for bounties on silk productions. The members of the group, however, separated without taking more definite action in this matter.

In concluding the report on wool, we gave the yearly production throughout the world. We cannot do less for the more costly material. The following statement, prepared by Mr. Franklin Allen, is believed to be a near approximation to the yearly production of raw silk in the several silk-producing countries of the world at the present time:—

China and Chinese Empire	\$92,928,000
Japan	19,800,000
Persia, Turkestan, &c.	6,250,000
Syria and Asia Minor	8,500,000
Italy	59,250,000
France	31,246,800
Turkey in Europe	7,920,000
Spain and Portugal	1,884,000
Greece	1,087,000
Morocco	300,000
Austria-Hungary	3,087,600
India	35,200,000
America	100,000
	\$267,553,400

Respectfully submitted,

JOHN L. HAYES.

APPENDIX

TO

REPORT ON WOOL AND WOOL FABRICS.*

THE PART OF THE WOOL INDUSTRY IN OUR NATIONAL ECONOMY.

GREAT truths never become trite by repetition. The mountains have stood unchanged in every outline of their gigantic features since the primeval cataclysms which uplifted them from the abyss ; yet in winter and summer, spring and autumn, in storm and calm, in sunrise and sunset, how varying are they in aspect, — eldest of created forms, yet for ever new ! One sermon, pronounced eighteen centuries ago, embodies all that the ministers of the church have preached for succeeding ages. Yet the truths of Christianity will be always as new as the dawn of each day with the same recurring sun. In the political campaign just ended, the tens of thousands of speakers on either side have been effective only by repeating the few rallying principles of their respective parties, and eager audiences have never wearied of hearing again and again that which they most earnestly believed. The old lesson of line upon line and precept upon precept, the old illustration of the perpetual water-drop upon the stone, must always be borne in mind by those who become weary in impressing upon others their convictions. If we have been presumptuous in the illustrations of the work we have taken in hand, it is because of our conviction that the truths which lie at the foundation of a wise political economy are among the great truths which demand perpetual enforcement. In the considerations above suggested, we find an excuse for discussing a topic which is neither original nor novel, but which involves the whole mission of our own work ; viz., THE PART OF THE WOOL INDUSTRY IN OUR NATIONAL ECONOMY.

Introductory Definitions. — Economy means a well-ordered arrangement, and a national economy a well-ordered arrange-

* The special relations of the American Wool Industry, as viewed under the light shed by the Exhibition, could not be fully considered in the general report, but are believed to be so important as to justify the modest position given to them in this Appendix.

ment of the material interests of a nation. We shall assume that the readers to whom we address ourselves, who are rather, in this case, the general public than specialists in the wool industry, will admit what is the universal instinct of intelligent nations, — that a wise national economy demands that a nation should fix upon its own territory all those branches of industrial activity which suit its soil, climate, and commercial position, or, in other words, whose acquisition is authorized by the nature of things; that the end of a nation, like that of an individual, is its own perfection; and that, as a means to that perfection, it should aim to develop the resources of its soil and the activities of its people until they become in all necessary things independent and self-sufficient. The accomplishment of these objects is the true national economy. By the wool industry, we understand every thing which relates to the production and manipulation of wool. We discard the distinction between wool growers and wool manufacturers as unsound, both performing an equally important part in converting the products of the soil into fabrics. The grower converts the raw material, grass and grain, into fibre. The wool scourer gives that fibre clean to the spinner; *he* furnishes the raw material, yarn, to the weaver; and the finished fabric of the latter is raw material for still other manufactures, as of cloth for the tailor, or felt for the paper-maker. The distinction, sometimes made between the producer and consumer of raw material, is therefore fallacious. The producer in every stage of the wool industry is both a producer and consumer of raw material; and the occupant of every stage has an equal claim with any other upon the national consideration.

The relations of the occupants of the first stage in the wool industry — that of wool production and its incidents, mutton production and sheep breeding — to the national economy naturally come first under consideration. Although in this branch of our subject we are peculiarly oppressed by the consciousness of an inability to add so little to what we have elsewhere said, familiar facts may be more strongly impressed by a new statement.

Sheep Culture not Sectional. — We are first struck by the fact that wool production, with its incidents, unlike the produc-

tion of any other raw textile material, can be advantageously pursued in some of its forms in every State,—certainly within our own territory. Cotton can be grown only in the South; silk only in California and Kansas; but wool-growing is suited to every soil and climate except those of the tropics or extreme north. It would be difficult to find an industry more cosmopolitan, or to which national encouragement can be afforded with less risk of arousing sectional jealousies.

Cheapening of Animal Food.—Chief above all the relations of the wool industry to the national economy are the benefits which it confers upon the State in the supply or cheapening of animal food. European economists manifest grave apprehensions on account of the increasing cost of animal food in the older nations. The *savans* of the Society of Acclimation in France have for years labored to conquer the prejudices against horse flesh, and have finally succeeded in establishing its regular sale in the markets of Paris. They even regard the siege of Paris in some measure compensated by the fact that its necessities reconciled the Parisian masses to the use of the flesh of dogs, cats, and rats for food.

Says the French Secretary of Finance, in reply to the allegation that duties on wool will increase the cost of clothing: "No matter: they will encourage the growth of sheep, and diminish the cost of food. *Alimentation is more important than vestiture.*"

Sheep, from the facility and rapidity with which they are matured, the rapidity of their increase, and their treble use for food, raiment, and manure, are the most available means of supplying a deficiency of animal food. Nature and the art of the breeder have made the sheep the most perfect machine in existence for converting grass and grain into flesh. France is turning her merino sheep into flesh-producing animals of equal weight with the South Downs, and maturing as early, yet retaining all the attributes of the merino fleece. Germany, less wise, but with the same object of increasing the supply of animal food, is abandoning her splendid merinos for the English mutton races. The superiority of the sheep as a meat-producing animal

has been conclusively demonstrated by experiment. It has been proved that seventy-five pounds of food (be it hay, corn, or turnips) will make as many pounds of mutton as one hundred pounds of the same will of beef, and that when ready for the butcher, the "fifth," or waste quarter, — the offal parts of the sheep, — will be three per cent less than that of an ox or cow ; so that, by this showing, the weight of food required to produce seven hundred and thirty pounds of beef would make one thousand pounds of mutton. When we consider the positive saving in the use of mutton over all other meat, its superior nutritiousness, and the facility with which it is digested, added to the fact that of all animals the sheep is easiest fed, we need not wonder that England, with its dense population and manufacturing cities, has been compelled to cultivate sheep up to the absolute capacity of her high-priced lands, and to attain the enormous number of 34,532,000, yielding an annual produce of over £30,000,000.

In England the indispensable necessities of its people are sufficient to stimulate the production of sheep. In this country the increase of sheep has been aided by the protective duties on wool. Thus we are able to draw a supply of mutton from thirty-five millions of sheep. The supply of pure mutton sheep — those of English blood declining for a time by the free admission of Canada combing-wools under the Reciprocity Treaty — was revived by the protective duties on combing-wools, under the tariff of 1867, and is now having a rapidly increased extension. The quality of mutton in all our markets has improved. It is daily increasing in popular demand. Where hundreds of sheep were sold in the Brighton market twenty years ago, there are now sold thousands. In the markets of New York, where sheep, a few years since, were slaughtered solely for their pelts and tallows, more time is required of the butchers to supply the demand for mutton than for all other meats ; and the returns of these markets show mutton to be worth from two to five cents more than beef. The consumption of beef for our armies during the war seriously diminished the supply of cattle, which required years to repair. The sheep husbandry, so capable of rapid increase, stimulated by the extraordinary activity of the wool manufacture during the

war, filled the void in the beef production, and kept the prices of animal food within reasonable prices; for the abundance of mutton kept down the prices not only of that commodity, but of all animal food. The benefits of this diminished cost of sustenance to every individual of our population has never been properly estimated. The cost of animal food to our population is certainly ten times that of wool clothing, which is but four dollars per head. Assuming that the whole duty on the cloth is a tax on the consumer, and that the sheep husbandry, and consequent supply of mutton, are stimulated by protection, we may safely conclude that the whole duty on the cloth is reimbursed to the consumer by the diminished price of food resulting from the protection of wool. No legislation can wisely disregard this relation of the wool industry to the national economy.

Sheep Husbandry Improves the Land.—Next in importance are the relations of sheep husbandry to an improved system of agriculture. These considerations apply much less to the simply pastoral husbandry, like that of California and Texas, than to sheep culture pursued as a branch of a mixed husbandry. Sheep are the only animals which do not exhaust the land upon which they feed, but permanently improve it. Horned cattle, especially cows in milk, by continued grazing, ultimately exhaust the pastures of their phosphates. In England, the pastures of the county of Chester, famous as a cheese district, are only kept up by the constant use of bone-dust. Sheep, on the other hand, through the peculiar nutritiousness of their manure, and the facility with which it is distributed, are found to be the most economical and certain means of constantly renewing the productiveness of the land. Mr. Mechi, the most famous of the living scientific farmers of England, estimates that fifteen hundred sheep folded on an acre of land for twenty-four dollars, or one hundred sheep for fifteen days, would manure the land sufficiently to carry it through four years' rotation. In the counties of Dorsetshire and Sussex, where the Down ewes are fed in summer on the hill grass, during the day, and at night are folded on the arable without food, the value of the manure is set down at one-fourth the value of the sheep. By the com-

bination of sheep husbandry with wheat culture, lands in England which, in the time of Elizabeth, produced, on an average, six and a half bushels of wheat per acre, produce now over thirty bushels. For these reasons, the recent practical writers in the *Journal of the Royal Agricultural Society of England* pronounce that, while there is no profit in growing sheep in England simply for their mutton and wool, sheep husbandry is still an indispensable necessity as the sole means of keeping up the land. Fortunately, we are able to find recent illustrations at home of the point above asserted.

Facts in America.—The eminent agriculturist, Mr. George Geddes of Onondaga County, N. Y., in an article written at our request, and published in the "New York Weekly Tribune" of September, 1876, has given the results of the sheep culture in mixed husbandry attained by the late William Chamberlain, of Dutchess County, N. Y.

In 1840, Mr. Chamberlain purchased a farm in Red Hook, N. Y., of three hundred and eighty acres, which had been used so long to raise hay for sale that it was worn out. The hay-crop of 1841 was seventeen loads; forty acres of rye gave ten bushels to the acre; twenty-five acres of corn averaged twenty bushels to the acre; the remainder of the farm was pasture, and proved equal to the raising of one span of horses, two pairs of oxen, and one cow. The land was so exhausted that it would not raise red clover. The so-called commercial manures were tried with but little advantage; and then Mr. Chamberlain resolved to test the Spanish proverb, — "The hoof of the sheep is golden." By using sheep as manufacturers of grain, hay, corn-stalk straw, swamp mush, leaves, and weeds into manure, he had, in 1844, not only restored this worn-out farm to its original fertility, but made it so productive that its crops would be satisfactory even in Ohio.

The account of the crops in 1864 showed six hundred tons of hay; forty acres of Indian corn, estimated to yield fifty bushels to the acre; wheat, for which the land is not well adapted, but the best crop with which to sow timothy and clover seeds, thirty acres, averaging fifteen bushels; thirty acres of oats, eight acres

of roots, and the pasturage of three hundred sheep, with the teams, cows, &c., necessary to carry on the farm and to supply the families on it with milk and butter.

Mr. Chamberlain's plan, when he first commenced making manure by using sheep, was to spread it thinly, so as to go over all the surface he could, and have enough to make clover grow; and he said that when he had brought his land to where it would produce red clover, thenceforth improvement was easy and rapid. The sheep not only gave the first impulse, but were all the time depended upon as the chief manuring power.

Mr. Geddes adds his own experience in raising sheep for many years in connection with grain. He says, "With about one sheep to the acre of cultivated land, pasture and meadow, we raise more bushels of grain on the average than we did when we had no sheep to manufacture our coarse forage into manure, and to enrich our pastures to prepare them for grain crops. While producing more crops on less acres, and at less cost than we did before we kept sheep, and, at the same time, constantly improving our land, we have the wool and mutton from our sheep in addition." These facts are conclusive as to the superior profitableness of sheep in mixed husbandry, and especially as an adjunct to wheat farming. We may add that these considerations have recently attracted serious attention in some older States. The Maine State Board of Agriculture have discussed the subject with great earnestness; and, in their last report, have published elaborate articles showing that an extension of sheep or mutton growing is of the first necessity to the agriculture of that State.

Promotes the Highest Arts of Agriculture.—Sheep husbandry in its higher branches is eminently promotive of the individual culture of those who pursue it, and is thus conducive to the intellectual advancement of the nation. It is well recognized that the simple culture of a single crop, whether of corn or cotton, is the lowest form of agriculture; but, when combined with the culture of animals, farming assumes a higher phase. The culture of sheep, especially connected with wheat-growing, has distinct advantages over other forms of stock-

raising. One advantage, though not directly bearing upon the immediate point in question, is that the ewe gives two dividends each year, — her fleeces and her lambs. The males give larger fleeces, and go to market earlier. The beef-producing animals give no dividends, and the grower must go on adding his expenses till the end of their lives, when in one gross sum he must find his compensation if he can. To this may be added that, in mutton production, the capital invested may be turned over two or three times during the same period that the same capital is employed in beef raising. This, however, is beside our subject. We have heard a striking advantage of wheat and sheep growing over dairy farming commented upon by practical farmers. In dairy farming, there is an unvarying routine of providing food for stock, selling the dairy products, and shovelling manure. There is no let up, no vacation to the farmer. In wheat and sheep farming combined, there are two short periods of excessive activity, — the harvesting and the lambing seasons; in the intervals, long periods for other pursuits of intellectual culture. Hence this has been called the aristocracy of farming.

The breeding of animals is now recognized as among the greatest of the creative arts. Professor Agassiz says enthusiastically of the stock breeders of the present day: "The practical realization of a theoretical acquisition has led them to make science the foundation of their business. From very empirical workmen they have raised themselves to be a class of thinking workers, who, as regards mental range, will very soon surpass every other industrial class, and before long will give society a totally new impress."

No class of stock-growers have done so much to merit this high praise as the breeders of sheep. This species being so plastic in its character that the breeder, according to Lord Somerville's celebrated saying, "may chalk out upon a wall a form perfect in itself and then give it existence," presents the most signal illustrations of the modern doctrine of evolution. The breeder has become a veritable creator. The products of his art have the permanency of primeval species. There are

convincing reasons for believing that the precious merino was converted by the art of man from the coarsest of the primeval sheep, the hair being dropped, and the underlying down, found still in the rudest of the ovine races, having been developed into fine wool. All the most valuable long-woolled races of England, so distinct in their characters, have been developed by human agency. The merino of Spain has been converted on the one hand to the electoral race of Germany, and the sheep Naz of France; producing fleeces of the utmost fineness, but weighing not more than a pound and a half, and with a length of fibre of less than an inch; and, on the other, to the Rambouillet sheep, producing fleeces of thirty pounds weight, with a length of five inches. New and unexpected qualities appear from time to time through accident, which the breeder turns to advantage, such as the silky Mauchamp wool, rivalling the cashmere, or even modifications of the skeleton form of the animal, as in the Ancon or *otter* sheep of Rhode Island, with limbs so formed that it cannot jump fences. A new attribute attained by the breeder's foresight, or his judicious application of happy accidents, may be of priceless value. Thence the immense money value of the best stock sheep,—a value enhanced by the rapidity with which the regenerating influence of the male propagates itself. The influence of one buck in three or four years may raise the wool product of a flock of a thousand sheep from five to ten pounds for each individual. There are cases which justify this statement. Thus, even in the time of the Emperor Tiberius, Spanish rams were sold for a talent,—about a thousand dollars of our money. The ram letting of two animals by Bakewell, the producer of the new Leicester sheep, produced in one season twelve hundred guineas. Our Mr. Hammond sold his bucks for five thousand dollars each; and even in Australia, where perfection in sheep-breeding might be supposed to be everywhere prevalent, a ram at a sheep auction in Melbourne, during the present year, "after the keenest competition was knocked down at three hundred and fifty-five guineas."

In the history of agriculture no names stand so prominent as

great benefactors as those of Robert Bakewell, the creator of the new Leicester; John Ellman and Jonas Mills, the improvers of the South Downs; Von Thaer and the Duke of Lecknowsky, in Germany the improvers of the merinos; Daubenton, the associate of Buffon, the founder of the French merino; Mr. McArthur, the creator of the Australian sheep husbandry; and Edwin Hammond, of Vermont, mainly the originator of the American merino. The nobility of sheep-breeding is recognized in all the advanced nations. The Empress Eugenie took the flock of Rambouillet under her special protection. The Queen of England takes pride in the choice flocks which adorn her parks. The English nobleman values the prizes for his perfected South Downs or Lincolns above all the honors of the turf. And, at a dinner of the landed gentry, the topic of sheep and turnips takes precedence of all other table-talk. Such recognitions lift the creative work of the sheep breeder to the rank of the highest of the arts of agriculture, and make its acquisition not only a source of national emolument, but an object of national pride.

A Means of Settling New Territories. — Pastoral sheep husbandry is of the first importance to the nation as the most effective means of settling and improving the vast unoccupied lands of the new or vacant States of the West and South. Of all the products of agriculture, wool is most capable of transportation; or, in other words, the greatest value can be placed in the smallest bulk, in a form liable to receive the least injury in the friction of transportation. When the freight of wheat from Chicago to the seaboard costs eighty per cent of its value, of pork thirty per cent, and of beef twenty-one per cent, that of wool is but four per cent; wool, therefore, may be grown with profit in the districts of the remotest interior favorable to its production.

Sheep in Russia. — No industrial movement of the present century is more marked than the development of the pastoral sheep husbandry, upon a vast scale, in new countries, distant from the markets where the products are sold. The manufacturing centres of Europe derive their chief supply from distant

and newly occupied regions. The wool production of England remains stationary; that of Germany, Austria, and France is declining. Russia, alone, among the European nations, with her vast unoccupied lands, is extending her sheep husbandry as the readiest means of occupying her distant possessions. The numbers of her sheep in the Russian Empire reach the enormous figure of 65,387,000. Single proprietors have not less than 400,000 animals. While Great Britain has 133 sheep to each hundred inhabitants, France 97, and Prussia 93, the whole Russian empire has 81, and certain provinces, as those of Central Asia, have 565 sheep for each hundred inhabitants. The culture of sheep receives the most watchful care from this eminently paternal government. This was well illustrated at the International Exposition. The choicest exhibit was made by an Archduchess. The imperial commissioner, himself a privy councillor, would not trust the explanation of the wool exhibits for awards to a subordinate, declaring, as he pointed out the characteristics of each exhibit with striking minuteness of information, that "this industry was peculiarly under the care of his government."

Argentine Republic. — Although the Argentine Republic did not seriously undertake the culture of merinos until 1826, she numbers now 51,500,260 sheep, producing 216,000,000 pounds of wool. *Estancia* after *estancia*, district after district, has passed into the hands of the sheep farmer. The value of sheep has increased tenfold within twenty years, and of land in the same ratio. The shepherds, from the poorest classes of English and Irish immigrants, have become wealthy proprietors, and the Republic, through her sheep mainly, has become the most prosperous of the states of South America.

Australia. — But Australia presents the most striking example of the influences of sheep husbandry upon civilization. In 1863, Captain McArthur brought a few merinos, from the choice flock of George III., to New South Wales. In 1810, the export of wool was 167 pounds. In 1875, the export of wool from New South Wales was 216,000 bales, — of the value, in the London market, of between five and a half and

six million pounds sterling. The number of sheep in the seven colonies of Australia, in 1874, was 61,684,127. The exhibits of wool from Australia, at the Exposition of Philadelphia, were the finest ever before made. Hardly less conspicuous than the wool exhibits were the evidences of wealth and progress in all the arts, the variety of products of the mine and the soil, and the illustrations of social and educational improvement, which made the exhibits from these distant colonies among the most attractive in the exhibition. The chief instrument of this civilization was the sheep. In the words of one of her commissioners, "Although Australia may freely boast of the unequalled richness and variety of her mineral productions, of the large returns and great fortunes amassed from her gold fields, yet nothing approaches the wool industry in importance." The close of this century will doubtless see these separate and dependent colonies incorporated into an independent Republic, and the extraordinary fact will be shown of an empire founded by the humble sheep!

Relations to Settlement in the United States. — It is only within the last ten years that the system of pastoral wool husbandry, as an independent industry, — after the methods of Australia, the Argentine Republic, and Russia, — has been undertaken in this country. The attempts in Texas were arrested by the war of the rebellion. The tariff of 1867, by excluding the over-production of the Southern Hemisphere, firmly established the pastoral sheep husbandry upon the Pacific coast. This year, from the returns which we have, California will produce fifty-one million pounds of wool; while, in 1860, the whole country produced, according to the census returns, but sixty thousand pounds. The pioneer wool-grower in California, Colonel Hollister, having led a company of emigrants to that State in 1852, saw, at the head of San Francisco Bay, a band of some two thousand Mexican sheep herded by two dogs, with no man in view. "If dogs can do this," said the colonel to himself, "what may not men do with sheep in a country like this, where grazing is perpetual, where no shelter is required, and where the natural increase is one hundred per cent annu-

ally?" Starting, in 1853, with eight hundred sheep, secured for himself from three thousand brought into California from Ohio in 1852, he formed a partnership with the Messrs. Diblee Brothers, who had been successful wool-growers in Los Angeles County. In 1863, the partners bought the great Lompoc rancho for sixty thousand dollars, and stocked it with ten thousand sheep. In 1874, the landed property was worth a million and a half of dollars, — all the result of sixty thousand dollars originally invested, and ten thousand sheep well handled. The product of four hundred pure merino ewes purchased in 1862 was, in 1875, fourteen thousand one hundred and ninety-three pure merino ewes, descended from the parent band, in addition to the males reared. In 1874, the sales of wool and sheep amounted to one hundred and twenty-four thousand two hundred and forty-nine dollars. With all these splendid results, in the words of his biographer, Colonel Otis, "Colonel Hollister himself looks upon sheep husbandry, not as an *exclusive* interest, to be prosecuted indefinitely on the extensive scale which now characterizes the pursuit, but rather as a pioneer industry for a new country, useful to bridge over the gap between a sparse and a dense population, and which ought to be gradually retired before the advance of settlement and the advent of the plough."

These words indicate precisely the part which the pastoral sheep husbandry plays in the settlement of a country. The sheep grower moves to new lands after opening those first occupied, to permanent agriculture. Sheep husbandry will advance from the foot-hills of California to the *parks* of the Rocky Mountains; and regions as wide as Australia or the Pampas of South America, supplied with aromatic grasses, preserving their nutritiousness during winter, lie open for pasturage between the Missouri and the Pacific. To give but one illustration: The Valley of the Republican is two hundred and fifty miles long and one hundred miles wide; containing two thousand five hundred square miles, or sixteen millions of acres. "There is not a rod of these sixteen million acres," says Dr. Latham, "that is not the finest of grazing, and which is not covered with

a luxuriant growth of blue buffalo and gramma grasses." He continues: "New York, Pennsylvania, Ohio, Michigan, and California are the five largest stock and wool growing States, aggregating sixteen million sheep. The sixteen million acres in one valley would graze all the sheep of these States, and still leave millions of acres of grasses untouched. Texas and other Southern States have millions of acres nearer at hand, with advantages of winter grazing equal to those of Australia. We have before us the careful estimates of the most experienced flock-masters in this country, proving that sheep husbandry can be profitably conducted in Texas on the same gigantic scale as in Australia and Southern Russia. Who will deny, in view of these facts, that the wool industry performs the high part which we claim for it in our national economy?"

Relations of Domestic Wool to Domestic Manufacture.—

The domestic production of wool is highly promotive of the perfection and abundance of the wool manufactures of a nation. As a rule, the characteristic wool manufactures of the leading nations have been determined by the abundance and peculiarities of their own raw material. Turkey, having no clothing wool, makes but few and exports no cloths; but she sends her beautiful Smyrna carpets and rugs to all the wealthy markets of the world, for the simple reason that she has in abundance the admirable carpet wool produced by the barbarous or fat-tailed sheep inherited from the remotest ages. It may be said that the United States excels in the manufacture of carpets, although producing no carpet wools. This exception to the general rule is due to the fact that American ingenuity, developed in other branches of the textile industry, first successfully achieved the manufacture of carpets by the power loom.

England, the creator of the long combing-wool sheep, and by far the first country in the world in their production, was the inventor of the countless dress fabrics for common consumption made from this fibre. It is first through these fabrics, the products of the peculiar fibre of her own sheep, that England ranks as the first wool manufacturing nation in the world, and, secondly, that she has practically the command and the first

choice of the products of her colonies, the fine wools of Australia and the Cape of Good Hope, although continental manufacturers apparently have free admission to the London markets of the Cape and Australian wools. The substantial advantages which the English have, in the command and first choice of these wools in their own market, is well recognized by other European manufacturers.

Germany, through the genius of her breeders, and the advantages of a dry climate and not too fertile soil, having produced the electoral fine-woolled sheep, immediately availed herself of this domestic possession to give a new character to woollen cloths. The light and fine German broadcloths became the rivals of the more substantial and less pliable West of England cloths, which formerly had undisturbed sway, and still dispute supremacy with them at the International Expositions.

France furnishes a still more remarkable illustration of the influence of a domestic wool production. It is well known that the most luxurious woollen dress goods for fashionable consumption, such as all-merinos, cashmeres, serges, matelasses, baskets, challis, besides countless novelties appearing each recurring season, are of French fabrication. France established her prestige in this fabrication through her possession of the merino combing wools, which she in fact created. The directors of the national sheepfolds of France, after obtaining merinos from Spain, instead of pursuing the German methods of breeding, aimed to increase the size of the frame and the weight of the fleece of the animal. With this increased size and weight, there was developed a corresponding length of fibre, and a merino combing wool was for the first time created. The French manufacturers were the first to avail themselves of this new property of wool, which their own territory supplied. National pride stimulated them to create original fabrics from the new material furnished from domestic sources. They invented all the fabrics above described, and more recently worsted coatings; in a word, all the woollen stuffs of the nineteenth century, which distinguish themselves in their physiognomy from the tissues of the preceding centuries. To France must be accorded

the honor of impressing the most characteristic features, both of the sheep husbandry and wool manufacture of the present age. This was the result of the combined possession of sheep husbandry and wool manufacture by a nation having a genius for the arts, and at the same time always fully appreciating the relations of the wool industry to a national economy.

In further illustration of this branch of our subject, we may compare two other European nations: one possessing great disadvantages in a deficiency of experience, but with abundant flocks; the other having the highest advantages of experience and traditionary skill in manufacture, but without sheep,—Russia and the Netherlands.

The first cloth factory in Russia was founded by Peter the Great, solely to provide cloth for his troops, in 1698, when Netherlands was at the height of its manufacturing prosperity. In spite of the encouragement of the government, the cloth manufacture made scarcely any progress during the last century; not improbably because Russia had then no merino wools. In 1820, prohibitory duties were placed on black and green cloths, and very high duties on other cloths. We infer also, though we have no exact data on this point, that the merino sheep husbandry began at this period to receive expansion. From this period the wool manufacture made rapid strides. In 1871, the factories in the empire numbered 1,339; the workmen, 121,070; and the value of the production reached the sum of 77,017,600 roubles. To this is to be added a much more extended woollen industry,—the home fabrication of cloth by the peasants. "The industry of wool," say the Russian statisticians, "suffices largely for the necessities of our vast consumption, and allows us even to export a part of our products to Asia." The excellence and variety of the Russian wool products were fully demonstrated at our International Exposition. We need not add that the raw material of these products is furnished to Russia by her sixty-five million sheep, twelve million of which are merinos. These facts show that it is by developing all her internal resources and making her industries independent of all foreign supplies that this vast self-contained empire dares to place herself, as she is

at this moment doing, in defiance of all the great powers of Europe.

Netherlands in the sixteenth century was the chief seat of the wool manufacture of the world. Then she absorbed the wool product of Spain and England. Without flocks, her wool industry has lost its importance, and in the poor displays at the exhibitions of Paris and Philadelphia there were but few traces of its former splendors. Switzerland, distinguished as she is in the silk manufacture, has no sheep and no woollen industry. Belgium, which has no sheep, but a very considerable wool industry, might seem to contradict our position. But with some few notable exceptions the Belgian cloth industry is characterized by its cheapness, and the use of the weakest and cheapest of foreign wools, which are sure to betray themselves in the fabrics.

The wool manufacture of the United States is conspicuously dependent upon our domestic wool production. It was hardly established until the introduction and rapidly increased culture of the Spanish merino in the decade of 1810 to 1820. It was modified by the introduction of the Saxon sheep in 1824-26, and still again by subsequent changes in the general character of American wools. The two branches of the wool industry have always stepped together, though unconsciously, quickened or retarded by the same general influences. As the flocks spread in the new States, the mills were planted in their midst, — not clustered in a few centres as in Europe, but broadly scattered, like sheep feeding in a wide pasture. In the State of Ohio, — the first of the wool-producing States, — there are in present operation 261 sets of woollen machinery distributed among 187 mills, and these mills distributed among 157 counties of the State. Some of the other Western States, all of which are eminently wool-growing States, have establishments and sets of machinery as follows : —

STATES.	Establishments.	Number of sets of cards reported.	Establishments, capacity not given.
California	10	59	2
Illinois	99	192	13
Indiana	157	216	33
Iowa	98	118	20
Michigan	55	55	20
Missouri	57	69	19
Oregon	9	22	1
Wisconsin	67	72	21

All these mills use, exclusively, American wool, and almost universally the wool produced in their immediate neighborhood. It would be safe to say, that not one of these mills would have been established but for the contiguous flocks, and that, if forced to seek imported wool, each one would stop.

The gain to the manufacturer and wool-grower from the contiguity of the flocks to the mill, and the mills to the consumer, is immense. There are savings of transportation, facilities for selection and purchasing, and conveniences, both to the manufacturer and wool-grower, in the direct exchange of cloth for wool. We have before us the individual returns of each one of the mills above enumerated. The mills are most of them small, from one to two sets in capacity. The remarks attached to so many of the returns, such as "sell our own goods at the mill," "goods made for home consumption," &c., show how they directly supply the necessities of their immediate neighborhoods, and what a saving is effected in transportation and dispensing with the middlemen. While the judges in the group of woollens at the Centennial were making their examination of exhibits for awards, their attention was directed to cloths, principally fancy cassimeres, exhibited by a mill of Oregon, of twelve sets, and therefore of very considerable magnitude. The styles, designs, and fabrication were excellent, as well as the quality of the wool. The significant fact about these goods was the inconceivably low prices at which they were marked, making them

the cheapest, for their quality, of any in the Exposition. The explanation of this phenomenon was that the cost of wool to the Oregon manufacturer produced from flocks grown immediately around his mill was about half that paid by the Eastern manufacturer. There was a saving of middlemen's profits and the transportation across the continent. The official award made by the judges expressly recognizes these facts.

The consumption of domestic wool is not confined to the Western manufacturer. All our manufacturers prefer American wools, at the same price, to foreign wools even nearly resembling them in quality. In view of the widely and erroneously asserted statement of the importance of extending our importation of foreign wools, we cannot too often repeat the results of the census statistics of 1870, relative to wool consumption in our woollen mills proper, — those producing cloths, blankets, flannels, &c.

Domestic wool used	154,767,095
Foreign	17,311,824
Cotton	17,671,920
Shoddy	19,892,062
Total material	209,022,910 lbs.

Thus the foreign wool consumed in our cloth mills is only ten per cent of the whole wool used, and is of less importance than the cotton and shoddy which enter into their production. These figures are sufficient to show that the very foundation of our cloth manufacture is the domestic production of wool.

There is still one other consideration which must not be overlooked. A nation can import only what it has means to pay for. Any check of domestic production diminishes the power of importation. The wisest of all our political economists, Stephen Colwell, has shown that a nation consumes abundantly, only when it produces abundantly. When Pennsylvania is able to produce in a year five hundred thousand tons of iron, through the activities and quickening influences of this industry, and the rapidity of the societary circulation of which the whole State partakes, she is able to consume all these five hun-

dred thousand tons. She pays for them through her own domestic production and exchanges stimulated by this great vivifying industry. Let the production of iron fall off, Pennsylvania will not import the deficiency. She will cease to consume. Railroads will cease extension, old tracks will not be repaired, the machine-shops will be stopped; with the arrest of production, the power of consumption comes to an end. This is as true in wool industry as in iron production.

Unfortunately our wool-growers did not do justice to themselves by the exhibits of raw fleeces at the International Exposition; but the foreign experts in the wool industry at Philadelphia saw with unconcealed surprise the evidences of our domestic wealth as displayed in our fabrics. They saw, with astonishment, blankets made from American wool in the new States of California and Minnesota, as well as old Massachusetts, which seemed fit only for royal couches; flannels, on the one hand, of snowy whiteness and of the softness of cashmeres, and others dyed with every hue of the rainbow, and in all varieties, so cheap and abundant as absolutely to shut out all foreign competition; shawls, pleasing in design and substantial in texture, and yet so reasonable in price that the humblest workwoman could afford the comely covering; yarns of every shade which the infinite applications of the knitter's art could demand, recalling Morris's lines, —

"The many-colored bundles newly dyed
 - Blood red, and heavenly blue, and grassy green;
 Yea, and more colors than man yet has seen
 In flowery meadows midmost of the May;"

fancy cassimeres rivalling the best products of Elbeuf looms; and worsted coatings which had their only rivals in the masterpieces of Sedan. They heard manufacturers declare that for all these fabrics they preferred American wool, because it is "stronger, softer, and works more kindly." We believe, in fine, that the conviction forced reluctantly upon our foreign visitors as to the power of America to supply its own markets, was due no less to the evidences of our command of raw

material than to the proofs of our ingenuity and skill in fabrication.

Before dismissing this branch of our subject, we ought to answer the question which will naturally occur to many, — What reason is there for the alleged superiority of American wools? The answer is not difficult. All experts in wool fibre recognize that there are well-marked characteristic qualities in the wools of different nations, even when produced from the same races. The American wools, to which we have referred, are those of the merino race, which are our principal product. Their superiority is due in the first place to a physical cause, — our characteristically dry climate. Prof. Sanson, an eminent French authority, has shown that a dry climate is indispensable for the health or successful culture of merino sheep, and that even the will of Napoleon failed to make the merino sheep successful in the moist or oceanic climates. The second and most important cause is a moral one. In all other parts of the world, the flocks of merino sheep are tended by hiring shepherds. In this country, as a rule, the farmer is his own shepherd, and the flocks are usually so small that they can receive the closest supervision. Not without an eye to thrift, but in part influenced by a morality which is of Puritan heritage, the American farmer would sooner starve himself than his animals. Regular and abundant feeding makes healthy sheep, and strong and uniform fibre; that is, without the weak spots caused by an occasional deficiency of food. Thus the high quality of American wools is due mainly to the moral habits of our farming population.

Part of the Wool Manufacture. — We have thus far considered only the relations of the agricultural branch of the wool industry to our national economy. We have yet to consider the wool industry as a branch of the mechanical, chemical, and industrial arts, or, in other words, the relations of the *manufacture* of wool to the State. The common sentiment of the civilized nations of the present day that, next to the preservation of liberty and justice, the highest duty and crowning glory of a nation is the acquisition of the industrial arts, is pronounced by the international expositions of the last half century. It will be

affirmed with enthusiasm by the eight million visitors to the Centennial, who have returned delighted, instructed, and inspired, as it were, with a new sense, an ambition for the precedence of our nation in the industrial arts. Among these arts, those of the textile industry take the first rank. They contribute most to the comfort of the people, and to one of the strongest passions of man, — the love of personal adornment; for, if there is one thought which predominates in a city population, it is that of the selection and preparation of clothing. In the great cities, it is the trade in textiles which throngs the thoroughfares, makes the streets gay with colored tissues, builds palatial warehouses, creates the highest rents, and secures the largest fortunes to the great distributors. The textile industry, above all others, displays the command of man over the forces of nature. Mr. Garsed, of Philadelphia, who manufactures in every day of ten hours thirty-three thousand *miles* of cotton thread, with the expenditure of force derived from seven tons of coal, has shown by careful calculation that, if it were possible for such quality of thread to be made by hand, it would require the labor of *seventy thousand* women to accomplish this work in the same time. The command of the improved textile manufacture increases the power of the factory operative over the hand-workman more than a thousand-fold. And this is the chief source of the supremacy of the manufacturing nations. The profit on the manufacture of cotton in Great Britain during the last fifty years has exceeded five thousand million dollars. Says Mr. Porter: "It is to the spinning-jenny and the steam-engine that we must look as having been the true moving powers of our fleets and armies, and the chief support also of a long-continued agricultural prosperity."

To come nearer home, the textile industry is the chief means of diversifying the occupations in the older States, of removing surplus population from worn-out lands, and of equalizing, by the aid of machinery, the weak muscles of more than half of our working population — the women — with those of men. It is shown by the first volume of the census returns of the State of Massachusetts, just published, that this State, having the most

dense population of any State in the Union, and ranking seventh in actual numbers, in 1875 employed in the textile manufactures 85,287 persons, and, if we add those engaged in the allied clothing manufacture, 28,935, — a total of 114,222; while the numbers employed in agriculture, the care of animals, and the fisheries is but 81,156. The whole number employed in all manufactures and other mechanical industries was 316,450. The products of manufactures and fisheries in 1875 was \$596,-415,866; while those of agriculture and mining were but \$43,-461,599. The prosperity of the city of Boston is due to the fact that it is the centre of distribution of the raw material and finished products of those manufactures. One of her own satirists first ironically called this city the *Hub*, — a phrase sometimes amusingly applied by strangers as an expression of her own conceit. But Boston, almost without metaphor, might be called the hub — of a vast factory wheel.

But our theme is the relations of but one branch of the textile industry; and the general facts first referred to have been introduced only to give force to the first proposition which we make in respect to the wool manufacture.

Pioneer of other Industries. — The manufacture of wool is the precursor of a general manufacture. The household fabrication of wool having been in former times, in temperate climates, the most extensively pursued of the household arts, the first advances from the rudest instruments to the more complicated machines were made in this industry, — such as the change from the distuff to the spinning-wheel; from the card to the heated iron comb of Bishop Blaise; from the fulling tub to the fulling machine moved by water, — the first substitution of the mechanical forces of nature for human muscles in the textile industry. In England, a protection of four centuries to the woollen industry had made her a nation of spinners and weavers, of artisans subsidiary to them. Commerce and capital had become familiar with the profits of a manufacturing industry; and the cotton industries were the natural offshoots of the wool manufacture, and needed hardly more than a hundred years to reach its present vast proportions. The Edict of Nantes, at the close of the

sixteenth century, which restored to France the Protestants, who had acquired in the Low Countries the arts of spinning, weaving, and dyeing woollens, first planted the wool manufacture in France, out of which her varied textile industry has grown.

In this country, the woollen mill is shown to be everywhere the pioneer of a diversified manufacture. As we have said elsewhere : " Settlements are made in the beginning upon our watercourses. Water power is first applied to the saw-mill ; then comes the grist-mill ; then follows the woollen mill. In old times, it was the fulling-mill with its carding-machine. The fulling-mill was, and the woollen mill now is, to a matured industry, what the emigrant's wagon is to the great interior, — the pioneer of manufacturing enterprise, as that is of permanent settlement. The cotton, the machinery, the iron, the silk, the paper manufactures follow, and build up our Lowells, Patersons, and Manchesters. This is no fancy sketch. We remember the time when the Salmon Falls River, between Maine and New Hampshire, watering a district which was occupied by one of the earliest and important settlements in New England, dating back to 1632, had no other manufacturing establishment than a saw-mill, a grist-mill, and a fulling-mill. The latter disappeared, and was succeeded, in 1828, by a well-appointed woollen factory. Afterwards came other woollen factories and cotton mills ; and the Salmon Falls River moves now one hundred and thirty-two thousand cotton spindles and fourteen sets of woollen machinery." This is but a type of the march of manufactures everywhere in the country. They propagate themselves by contagion ; or, like the banyan tree, their branches descend and become trees. The communities where they are planted become imbued with industrial instinct and knowledge. Hence, practical men say that the best place to plant a new mill is by the very side of those which have been long established. Manufactures not only propagate themselves, but engender other industries, as cultivation, with new plants and flowers, attracts and multiplies the birds and insects. The erection of a woollen mill of two or three sets, in a new State, which seems to us a trifling affair, is an epoch, the dawn of manufactures, which all experience tells us will expand into a

widely diversified industry, and its attendant results of wealth and culture.

Demands high Intelligence. — One reason for the influence of the woollen manufactures is the high character of intelligence and skill required for its successful pursuit. In this respect it undoubtedly stands at the very head of the textile industries. Great, undoubtedly, as was the genius displayed by those who introduced the cotton manufacture in its present form into this country, there is much less required in continuing its fabrication. The whole product of a mill often consists of but a single fabric. As Mr. Bachelder, the most eminent cotton manufacturer living in this or any other country, says: "Thousands of looms are employed making drillings, of precisely the same description, with the same number of threads both in the warp and filling, of the same average weight, with yarn of the same fineness, and without the least variation in any particular, as were first invented and made by me in 1827."

In the wool manufacture, especially since the general disuse of broadcloth, the requirements of fashion demand new fabrics or new designs every season. A large fancy cassimere mill will produce not less than two hundred distinct designs each season, making four hundred in the year. In some mills there are made not less than fifty distinct classes of fabrics, to say nothing of styles. New fabrics perpetually call for new machines. The producer in this industry can have no rest: he must be constantly learning. No degree of skill in the selection of other fabrics is comparable with that which must be exercised in buying and applying wool. Its preparation is more difficult, and the finish of its products is more complicated. Add to this that the dyeing of the wool fabrics requires what is a distinct art by itself in Europe, and in some branches, such as the indigo fermented vat, is the most difficult work in practical chemistry, and we see a sufficient reason why the wool manufacture takes the first place in the textile arts. Some branches of the wool manufacture, like that of carpets, require the most profound knowledge of the principles of decorative art; others, like that of printing stuffs, are based upon a knowledge of the chemical

arts. Indeed, it may be said that no industrial work brings so fully into play the results of scientific research and the practical applications of art as the vast establishments in this country which make and print the mixed dress goods of cotton and wool. Thus it will be seen that the acquisition of a perfected wool industry is in itself the possession of the most important arts.

The Manufacture essential to a Successful Sheep Husbandry.

We have shown that without domestic wool we should not have mills. On the other hand, without mills we should not have sheep. We have exported so little wool that it has been said that the value of imported playing-cards exceeds the value of all the wool sent abroad from this country. Under the prevailing system of growing sheep in small flocks, it would be clearly impossible for the American farmer to compete in the markets of the world with the possessor of a hundred thousand sheep. We shall never export wool until a system of pastoral sheep husbandry, without artificial feeding in winter, is developed on a scale as broad as in Australia or Buenos Ayres. And the only means to that end is a market for our wools at home. For many years to come, the sole dependence of the American wool-grower must be the consumption of our home mills. Even with an equality of natural facilities, the prices of labor, the high interest on capital, local taxation, and the general expenses growing out of the higher demands of American civilization, will not permit our wool-growers to compete with the producers of wool in the southern hemisphere. No one can doubt for a moment that our mills sustain sheep-growing in this country for *wool* alone. But it may be said that mutton sheep would be grown for their flesh and lambs; while the wool might be exported, as in Canada, which has no home market for its combing wools. In reply to this, we note the fact that, because she must export her combing wools, Canada is rapidly diminishing the production of her mutton sheep, filling their place with merino sheep, to supply her newly established cloth-mills; while contiguous American States — Michigan, Ohio, and New York — are even more rapidly increasing their combing wools and mutton sheep, for which they have a home market in the

worsted mills and the populations which the mills gather around them. Thus, recurring to the earlier propositions advanced in this paper, our woollen manufacture directly benefits the nation in supplying animal food, improving general husbandry, and settling new territory.

Clothes our People. — Our own woollen manufacture cheaply and abundantly clothes our people. Our last proposition has established that our wool manufacture contributes materially to the first necessity of a people, by supplying animal food and increasing the productiveness of lands, thus cheapening bread. The benefits it confers in supplying the second necessity, clothing, are beyond calculation. Much as cotton and linen contribute to cleanliness and comfort, and silk to adornment, wool, in our rigorous climate, is the only absolute necessity. It formed the sole clothing of our million soldiers in the great war. Falstaff said: "There's but a shirt and a half in all my company." With respect to linen and cotton, the same might have been said of all our armies. So easily did our mills supply one of the first necessities of armies in the field, that, at the close of the war, there was an overplus of three million overcoats.

Sanitary Influence. — Before proceeding to demonstrate the proposition in hand, we will pause a moment to consider the sanitary influence of abundant woollen clothing. Recent life statistics have shown that the average period of life in civilized nations has been lengthened several years during this century. The more extended use of woollen clothing has materially contributed to this result. The soldiers of our Revolutionary war were largely clothed in linen. For general female use there was nothing better than the linsey-woolsey, with linen warp and woollen woof. This was not abundant on account of the scarcity of wool. As wool became more abundant, and cloth was made in families, the best homespun was scarcely thicker or warmer than a common flannel of our times. Half a century ago, even the cloths worn by the wealthy were light and thin compared with those now in use. The use of woollen underclothing, such as flannel or knit shirts and drawers, was almost exclusively confined to men of the easy classes. Women in moderate circumstances

wore only cotton dresses ; for the invaluable mixtures of wool and cotton, the mousselines-de-laine and alpacas, were unknown. Women and children of wealth were clad more thinly than the poorest of our day ; and consumption stalked with its deadly scythe over all our northern land. To-day, in our New England districts at least, the wool-knit undergarments are worn by all classes of every age and sex. Every working woman has her mixed woollen dress and her warm woollen shawl ; every workman, his knit cardigan. No laboring man is so poor as not to have an overcoat. We remember the time when not one man in ten in the country districts had such a garment. The cloths for common wear are of double the thickness and warmth that they were even thirty years ago. Some of them, such as the Esquimos and beavers, are impenetrable to the cold. For outdoor winter wear, the material for clothing of men and women is almost identical. Women discard "ladies' cloth," and don cloaks of beaver or kersey and dresses of fancy cassimeres ; while the universal waterproof makes rain and snow innocuous. Physicians concur in declaring that, as a result of this improved clothing, colds and pneumonia are less prevalent, and the ravages of consumption have been largely checked. The *sanitary* influence of the woollen industry is, therefore, no mean part among those which it plays in the national economy.

Capacity and Product of American Mills. — The question next arises, Can our own industry perform the great work of clothing our people *cheaply, abundantly, and well* without help from abroad? In answering this question, we must repeat facts elsewhere stated in other connections, and familiar to many of our readers.

First as to our machine capacity. It will serve the purpose of our argument equally to take the census statistics of 1870, while they have official authority.

The number of sets in the manufacture of woollens proper, consisting of cloths, flannels, and blankets, and yarns, is placed at 8,336. In the worsted manufacture, the number of combers is set down at 193, and the number of sets at 98.

One combor being the equivalent of three sets, the total in sets is 677.

In the carpet manufacture, the number of sets is 241, with 100 combors, making a total in sets of 541.

In the hosiery manufacture, including cotton, but principally wool, 519 sets.

Recapitulation.

Woollens	8,386
Worsted	677
Carpets	541
Hosiery	519
Total	10,073 sets.

The value of the products of this machinery, as given by the census, was as follows : —

Woollens	\$155,405,356
Worsted	22,000,381
Carpets	21,761,578
Hosiery	18,411,564
Total	\$217,578,824

Our imports in that year were : —

Woollens	\$14,660,408
Worsted Dress Goods	15,447,960
Carpets	8,940,707
Total	\$34,049,070

Add to this, which is the foreign valuation, the custom duties, premium on gold, and profit of importer, making the home valuation double that of the foreign, the home value of these imports equalled \$68,098,140. This, added to domestic production, made our whole consumption in 1870 \$285,676,964. So that our domestic production constituted three-fourths of our whole consumption. As to the character of the machinery and processes used in the above-named 10,073 sets, which, in fact, represents the degree of skill attained, we repeat the statement made to us personally by one having the highest authority ; viz., Prof. Herm Grothe, of Germany, the author of the

latest and most esteemed European treatise on the manufacture of wool, who, the last summer, visited our principal representative establishments. He declared that our mills had all the recent machinery and processes found in the best mills abroad, and that he saw nothing to be improved either in the mechanical appliances or administration of our establishments.

Character of our Products. — Having had the opportunity of an official study at the International Exhibition, for many weeks, in company with able foreign and American experts, of our own wool products in comparison with those of other countries, we feel authorized to express an opinion as to the character of our products with confidence. In woollens proper, we make, with no exception now occurring to us, all the classes of fabrics made in the best European mills. The same may be said of hosiery. In worsteds, we make all mixed cotton and wool dress goods, — the classes of dress fabrics entering into most general consumption, and therefore of the first utility, — and many all-wool worsteds. We do not make the all-wool merinos and cashmeres, which are not made successfully even in England, nor some other fine wool novelties in dress goods, which are obtained wholly in France. Their use is confined to the wealthy and fashionable classes. Some we have very recently attempted with signal success, — such as the all-wool merino plaids and matelasses, — and shall doubtless make them all, except possibly the merinos and cashmeres. In carpets, we produce every variety except the Persian and Turkish and the Aubusson hand-made carpets, used only by the opulent classes.

In woollens, we are inferior only in broadcloths, and that not in quality, but in quantity of production, the general disuse of broadcloth, except for dress suits and by the wealthy, making it more profitable for our mills to run on goods in general demand. That we have no want of capacity is shown by the product of the few mills who still pursue this branch of manufacture, and by the fact that the finest sample of broadcloth shown at the Exposition, though not for competition, was made in this country twenty-three years ago. In blankets and flannels, our products are absolutely unequalled by any made abroad. In

fancy cassimeres and worsted coatings, — the great articles of consumption all over the world, — we equal any, surpass most, made abroad, in texture, finish, and beauty of design; foreign manufacturers eagerly seeking samples for imitation in their mills. Our thicker cloths for overcoatings suffer nothing in comparison with those made abroad.

In dress goods, there was little opportunity to make comparison, as Bradford, the principal competer in classes of goods made by us, did not think it wise to enter the field. But the command of our own market against foreign competition settles the question as to the quality of our goods. In carpets of the cheaper and medium qualities, up to two and three ply ingrains, we are without competition, making the cheaper kinds so abundantly and cheap, that no home, however humble, need be without this most characteristic of household comforts. The extent of their use in our homes was a subject of surprise to our foreign visitors. The higher classes of tapestries and Brussels, and still higher, of Wilton and Axminster, in taste of design and perfection of texture, were absolutely equal to the best foreign samples; and, judging from the length and closeness of the pile, surpass them in wearing qualities. In this department, we have nothing to learn abroad.

The question of comparative cheapness of goods is more difficult to fix exactly. Foreigners declared that our fancy cassimeres were equal to those of Elbeuf, and cheaper than similar goods could be obtained in the French market. On the other hand, the cloths of Belgium and Yorkshire were unquestionably apparently cheaper than our own; but this apparent cheapness is illusory in a great degree, when we consider the low character of the materials which enter into their fabrication, — in one case, weak Mestiza wools; in the other, shoddy, — when compared with the substantial material of the American cloths. We do not hesitate to assert that there are no medium woollen goods, such as constitute the great bulk of consumption, which, in wearing qualities, will compare with American fabrics. The English admit that they consume not less than *thirty-eight thousand tons* of shoddy annually in making their woollen

goods. The Belgians boast that they use the cheap Mestiza wool, and laugh at the Americans because they "stick to the old-fashioned, strong-bodied, long-stapled wools," which are so valuable that they ought to be used for combing purposes, and because we do not "turn to advantage all wastes and refuses, which now, skilfully mixed, play such an important part in lowering the cost of fabrics." (Mr. Fornau's letter, published in "Bulletin.")

The point which we make is, not that the English and Belgians do not obtain their cloths more cheaply than we do, but that it is more *economical* for us to consume our own products than to depend upon the English and Belgians. The question of economy involves the wearing qualities of our cloths, the facilities for paying for them by domestic exchange, — as with wool by the farmer, with labor by the mill operative, with market produce by the gardener, or other facilities which attend home consumption. One of these facilities deserves attention, as it is the very climax of our wool industry. We refer to our ready-made clothing manufacture. Nowhere has this manufacture attained such perfection and economies as in this country. It is founded upon our wool manufacture; for seven-eighths of its raw material is furnished by our mills. So important is this industry, that it employs directly in Massachusetts alone 28,935 persons. Upon so vast a scale is it conducted that one establishment in Philadelphia, John Wannamaker's, covers two and a half acres, and one floor contains two million dollars' worth of goods. This manufacture clothes all the boys and the great bulk of our male population. It is declared by experts in this industry that "the wholesale manufacture has reduced the cost of clothing to the masses *one-half* certainly, and, making allowance for the difference in the value of money, even more." That system of production and consumption proves itself to be most economical to the people which makes consumption the most *abundant*. That our people are the most abundantly and substantially clothed of any in the world needs no demonstration. It is shown in our army and the vast superiority of its cloths over those furnished to any foreign troops. It is shown in what for-

eigners at Philadelphia so much admired, — the beauty of the uniforms of our volunteer troops. It was shown in the costumes of the millions at the Exposition ; and, especially, in the absence of all distinction of garb in the people of the seaboard cities and the remotest interior. The personal appearance of a population indicates its social condition. And thus the woollen industry performs its last part in the national economy by abolishing the outward distinctions of class, and cultivating the personal self-respect of the individual citizen.

A question of public economy like that which we have discussed addresses itself directly and imperatively to those who control and influence national legislation. We have failed in our purpose, if they do not apply the lesson which these facts teach.

JOHN L. HAYES.

SPECIAL REPORT ON THE EXHIBITS IN GROUP XIII.

AT THE

UNITED STATES INTERNATIONAL EXHIBITION OF 1876 :

Embracing Several Classes,—Paper, Stationery, Printing, and Book-making.

BY JAMES M. WILCOX, CHAIRMAN OF GROUP XIII.

PHILADELPHIA.

FRANCIS A. WALKER, Esq., *Chief of Bureau of Awards:*

DEAR SIR, — In entering upon our duties in the examination of the various classes of objects allotted to Group XIII. of the Centennial Judges, a cursory glance over the entire Exhibition impressed us painfully with the magnitude of the work before us. No less than sixteen classes confronted us, some of which included many hundreds of objects, and the entire examination must, of necessity, extend over many thousands. The exhibits in Class 258, embracing stationers' articles, were very numerous, and from many parts of the world; and, although very interesting, brought to light little that was quite new. Perhaps there is little room for novelty in this class; but the ingenuity and skill displayed in perfecting the various articles that compose it were very apparent. Of fancy note-papers, envelopes, cards, &c., there was an endless variety, gotten up almost invariably in good taste, and made up of the best materials. The gold and steel pen manufacture seems to have reached nearly perfection; and the same may be said of every variety of brush, crayon, and pencil. The best pencils are as yet brought from abroad; but one exhibit made from American graphite is of great excellence, and bids fair to equal the best heretofore imported. The inkstand has not yet reached perfection; and this fact seemed to be realized by manufacturers, who in their efforts have displayed an almost endless variety, and who pressed upon us with great assiduity the superior claims of quite a number. India-rubber enters largely into this class; but the Exhibition has shown no very recent important extension of its uses for stationers' articles.

Class 259, embracing all varieties of the finer qualities and styles of paper, was well represented; and the exhibits were very gratifying. In this class, a marked difference was observed between the American papers, taken generally, and those, taken generally, from abroad. A

keener competition in the manufacture of fine paper has for some years existed here than elsewhere, resulting in a greater perfecting of some qualities of paper; and a greater refinement in the various styles of presenting the same to the market is quite apparent among American manufacturers. Among these qualities are, conspicuously, heavy letter and note, cap and ledger, papers; above all, the last. These papers, as produced by leading American manufacturers, were found to be made invariably of the best and best-mixed stock, of unexceptionable colors in white and blue, of generous thickness, and sized with animal sizing in the sheet. The low rate of postage in the United States has, no doubt, encouraged the production of thick writing-papers pleasant to use; and the enormous American demand for large blank-books has stimulated the competitive manufacturers of these to demand of the paper-makers the best quality of ledger paper that can be made. This demand is admirably well supplied; and the exhibits of American paper of this character called forth expressions of admiration from many foreigners. The foreign papers generally, on their side, displayed some points of excellence over the American. Owing to higher rates of postage in other countries, their writing-papers have been for many years made exceedingly light, and European manufacturers have almost universally attained to greater perfection in very light papers. The Exhibition has not indicated any important departure from the old rule of very thin letter-paper that has so long obtained in Europe. In Great Britain, France and Germany, particularly, great skill and science have been expended upon producing the best paper from inferior stock; and manufacturers there have thus cheapened the cost of good paper. In the colors and tints of their fancy papers, they have reached great perfection; and in these points they excel American manufacturers. The Russian papers were found to be made of excellent stock, which seems to abound in that country; and the Russian exhibits were good. The Italian papers in the Exhibition were nearly all hand-made, of good stock, good color and texture, very strong and serviceable, but of lower finish than most others. Some of these were of remarkable size for hand-made paper, and showed great skill in hand manufacturing. The exhibit of Spanish papers was large and varied, and contained much excellent paper. Its cigarette papers were remarkable for fineness and strength; and other qualities show, upon the part of the manufacturers, a thorough knowledge of the taste to which they have to cater. Nearly every Spanish exhibit contained specimens of cigarette paper; and it is worthy of remark, that nearly every paper exhibit from the Continent of Europe, from Spain to

Russia, contained excellent paper of this character. The only specimens of photographic paper shown came from France and Germany. This paper is difficult to perfect; and its points of excellence have not been much studied by American manufacturers. It is necessary that it be perfectly free from particles of iron and steel, no matter how minute; as these would be developed into stains by the regular treatment it has to undergo in the photographer's laboratory, and the American plan of beating the stock with a steel-armed roll upon a steel bed-plate precludes the possibility of having the paper absolutely free from liability to iron stain. When any one of our mills shall adopt the expensive European plan of using brass exclusively, instead of iron or steel, there need be no serious difficulty in manufacturing the best of photographic paper. A feature in which nearly all European paper-makers excel is in pulp or engine sizing. In this, they leave American manufacturers far behind. It is noticeable that, whereas the latter size in the sheet, with glue-sizing, all their best and medium writing-papers, the former produce a very hard-sized paper by the cheaper process of pulp-sizing. This process should receive greater attention in our country; and there is no good reason why the medium grades of American writing-paper should not be manufactured in mills that do not possess drying lofts, as in older countries.

In confirmation of my views regarding American blank-books and paper, I am glad to be able to present those of Mr. Gustav W. Seitz, of Hamburg, Germany, — one of my associate judges, and a gentleman of great experience and mature judgment. These have been given me by him in the form of a letter; and, as the whole communication is in reference to the work of our group, I transcribe it entire: —



PHILADELPHIA, July 24, 1876.

JAMES M. WILCOX, Esq., President of Group XIII.,
International Exhibition in Philadelphia:

DEAR SIR, — In compliance with your request to name such articles observed by me as are worthy of special notice on account of their excellence, I beg to state the following regarding the American exhibits: —

(1.) The binding of books, as well as the manufacture of blank-books, is, as to solidity and execution, decidedly the best I have seen in the Exhibition. The same judgment applies also —

(2.) To plain and illustrated printing, which, in beauty and clearness, by using the best of materials (paper and ink), can compete with

any thing displayed. It is quite natural to here make mention of the —

(3.) Machines, which, being mostly constructed in a very ingenious way, aid very largely to accomplish such work.

(4.) The patterns and castings of the types, also, are elegant and worthy of being copied; and, all considered, I can well assert that the graphic arts in the United States are at the height of the times.

It is, of course, not my intention, in giving this testimony, to under-rate the merits of my own and other nations; yet it is true that no department is as well represented, comparatively, as the American. It is an agreeable surprise to me to become acquainted with the above-stated facts, which so clearly show the progress made by America in the graphic arts; and I shall not fail to make them known in Germany, being confident that many will be benefited thereby.

Finally, worthy of special notice is the courtesy and indulgence constantly tendered to me by our honored president and my fellow-judges. They will always be remembered by me in pleasant memory. I feel compelled to state, that it gave me the greatest pleasure to be associated with you. I remain, dear sir,

Yours very respectfully and sincerely,

GUSTAV N. SEITZ.

One feature, as I have stated, in which European manufacturers of paper excel, is the variety and excellence of their colors in fancy papers. A longer experience in this line, and a necessity to cater to a greater public taste for fancy papers, have placed them quite in advance of our manufacturers in this art; yet a great advance has within a few years been made here, and some of the American exhibits make a very handsome show of colors.

Very little bank-note paper was found; the most notable exhibit being that of a Massachusetts house, of long standing and excellent reputation. With this character of paper, American manufacturers have long held pre-eminence. This fact is probably explained by a comparison of the circumstances attending the issues of the respective paper currencies of Europe and the United States. In the former, until within a few years, no small notes were used; and the notes of large denominations circulated only amongst the wealthier classes. They were consequently little handled, were kept clean, and circulated but a short time; being generally retired when once redeemed at their place of issue. It was not important that the paper for them should possess wearing qualities in a high degree. In our country, on the

contrary, we are accustomed to notes of small denomination; and, for a very long period, paper among all classes of people has been the material of currency, generally of denominations of one dollar and upwards, and notes have been repeatedly issued to save cost of new ones, long after they became unfit for public use. The frequency of counterfeiting in our country rendered necessary costly engraving and printing, and American bank-notes are, compared with most others, very expensive; hence a reluctance on the part of our banks to frequently renew them. These circumstances explain the demand, on the part of the banks, that their paper should wear as long as possible; and the demand has been well met on the part of our leading manufacturers. The exhibit of its special currency paper made by the United States Treasury Department, in the Government Building, was entered simply as a contribution to the government's general exhibit, and not for competition. Its special feature is a *localized*, colored fibre so incorporated into the sheets as to appear only in a fixed part of each note when printed, and not elsewhere. This paper has been in use since 1869, is essentially American in discovery and manufacture, and is now used exclusively in the United States for national bank-notes and United States Treasury notes of all denominations. One interesting exhibit of paper of bank-note character turned up unexpectedly in the Mexican Department. This paper was indifferently well sized and woven; but was of remarkable strength and pliability. It was manufactured from the leaf filaments of the Maguey plant (*agave Americana*), of which a specimen, growing in a flower-pot, was brought from Mexico for exhibition. The provincial name of this plant is *Quiote*, and it is described as one of the characteristic and common plants of Mexico, growing throughout the low valleys; where it has been long cultivated for its juice, which is made into a fermented drink. On the mountains it grows wild; and the largest plants found are near Llanos de Apan, between Vera Cruz and the City of Mexico. Somewhat resembling a cactus, and possessing spines, it spreads its long leaves to a diameter of 6 to 8 feet, from the centre of which rises a straight stem, 10 feet high, and tipped with yellow flowers. It is propagated by transplanting suckers that spring up from the roots and grow vigorously. When the filaments are prepared for paper-stock, the leaves are hackled green; the flesh easily separating and leaving behind a good handful of fibre. I have described this plant somewhat minutely, since, from the best information I could gain, it promises to be in the future of great utility in paper-making, especially as I hear that it can be cultivated at a very low cost.

Of printing papers (Class 260) the display was not great; and there seems to be but little inducement to bring them from abroad for exhibition. Those shown from there were of a more natural color than the American book-papers, which, to meet a taste on the part of our publishers that is not to be commended, are bleached to such an extent, and supplemented with a delicate tingeing of blue and red, as to become of too dazzling a whiteness to be either pleasant or harmless to the eyes. Some displays, however, of a more neutral or creamy tint, seemed to promise a prevalence of better and healthier taste in the future. The cost of printing paper is as low, and in some cases lower than it was twenty years ago. At that time the supply of raw material was getting scarce, and it seemed probable that paper would become higher every year. The necessity of the case, however, stimulated invention, and developed the use of, first, straw, then wood, as partial components of printing paper. The perfection of wood fibre has advanced faster than that of straw; its admixture has become common in both news and book papers; and to this is due, principally, the present low prices of these papers in the market. There were several very interesting exhibits of wood-fibre pulp for paper-makers' use, — some prepared merely mechanically by grinding the fibre from the block, and some by a disintegrating, chemical process. That prepared in the latter way (which is hard boiling in alkali under high pressure) is much superior; having much greater length, strength, and flexibility, and being much more free from natural gum and all else that is not pure cellulose. The wood pulp exhibited from the United States was principally from poplar; that from Sweden and Norway (the most important European exhibits), principally from pine. The latter, though less pure, had greater strength, and was the strongest I had ever seen; which leads me to believe that the pine of these countries possesses unusual toughness of fibre, and is peculiarly well adapted to the manufacture of paper pulp. Other interesting exhibits were made of raw materials for paper, among which were the *Maquay* plant, from Mexico, already described; *Esparto* and other grasses, from Spain; banana leaves and *Halfa* from Egypt; and quite a series from Victoria, Australia. *Halfa* is a species of swamp rush growing abundantly in Egypt; and the paper made from it was fair in quality and color. That made from banana leaves was of a pleasing buff, natural color, and looked quite handsomely when printed and bound. In the Victoria department were many specimens of paper made from various fibres, rather crudely prepared; some of which, I am satisfied, could be well utilized in the manufacture of finer papers. I deem this matter to be of considera-

ble importance; and cannot so well do it justice as by transcribing in full the following letter to the commissioners from Melbourne from the curator of their botanical gardens, explanatory of the exhibits of paper fibres and dyes:—

GENTLEMEN,—I have the honor, as you request, to furnish a description of the fibres, papers, gums, resins, dyes, woods, carpological specimens, &c., prepared and sent by me to the Melbourne Exhibition, and which you have been pleased to forward to Philadelphia.

As regards the fibres, papers, and woods, it must be admitted that they far exceed in number those which have been sent from this establishment to former exhibitions. The whole of the exhibits described were prepared by myself and two assistants, with but crude appliances at our command, and within eight weeks prior to the opening of the Exhibition. The greater portion of the necessities forming the laboratory which once belonged to this department were transferred to another branch. Thus I have had to make the best of the few opportunities afforded me for preparing in so short a time the present collection. The fibres, some forty in number, were produced in a very primitive way; the branches or leaves of the plant being merely steeped in water, and afterwards combed by hand. The quality and quantity, however, of each kind thus prepared will, I trust, serve the purpose of testing their commercial value at Philadelphia.

Many new discoveries in the way of fibre-yielding material are shown, not only of Victorian native products, but those of the other colonies acclimatized here; and of exotics also hitherto esteemed only for ornamental purposes in gardening.

Had time permitted, my collection of exhibits would have been far greater. I would have been able to collect and test the value of many plants which I know exist on the borders of Gippsland, and even nearer to Melbourne: I mean the Macedon and Dandenong Ranges. It is almost needless for me to say that the colony of Victoria affords great facilities, both as regards soil and climate, for the cultivation of the valuable commodities which constitute fibre and paper material. For instance, the Chinese grass-cloth plant ("*Boehmeria nivea*"), the New Zealand flax ("*Phormium tenax*"), the "*Fourcroya gigantea*" the "*Agaves*," the "*Lagunaria Pattersoni*" (Cowitch tree, of Norfolk Island), the *Yuccas* (*aloifolia*, *flamentosa*, and *gloriosa*), the *Sparmannia Africana*, and a host of other foreign plants, all thrive as well, and in some instances better, in this colony than in their native homes.

The samples of *Sparmannia* sent to the Melbourne Exhibition have been prepared from both the living and dried barks of the shrub. I have never read of it ever having been discovered that this plant contained a fibre of any value. Hitherto I had only known it to be interesting as an ornamental shrub, or the plant in whose blossoms the great Linnæus first discovered the sexual system in botany. My introspection of its fibrous nature, as with others now exhibited, was only gained by mere accident, in a hurried attempt to collect and prepare a variety of fibres for your Exhibition; but, if even one of them proves to be of commercial value, — and I believe *many* of them will, because of their textures and the quickness of their growth, — the object I have in view will be gained, as they will be a boon to the colonists. The *Sparmannia*, like the grass-cloth plant of China, as soon as cut, shoots up (even in a poor soil) with wonderful vigor. The canes (if I may call them such) are often as thick as one's thumb; and they average in height from 6 to 8 feet. In good soil two crops may be safely reckoned upon in the year.

The plants of Queensland from which fibres have been prepared have all been grown here, and were introduced by the late Mr. Dalachy and the Baron von Mueller, my predecessors in the directorship of these gardens. Judging from the growth of the *Hibiscus heterophyllus*, *Sida retusa* (Queensland hemp), *Pipturus propinquus*, or Queensland grass-cloth plant, *Brachychiton acerifolium* (the flame-tree), *Sterculia rupestris* (the bottle-tree), and the samples of fibre now produced from them, the harvest to be gained by their cultivation in Victoria would be as great as in the sister colony. It may appear strange to many, that plants like these and others described, indigenous to a warmer clime, should thrive as well, and even better, in a cooler one; yet there are ample proofs that such is the fact. The growth of the flame-tree, for instance (*Sterculia*, or *Brachychiton acerifolium*, of Queensland and New South Wales), is more rapid in Victoria than in either of the colonies mentioned; and the *bast* furnished by this tree is, I consider, superior to "*Cuba bast*." This, of course, remains to be proved by those in Philadelphia, who are better able to judge of its merits, and of others which I have described in my list. But it is more singular still to observe, that plants which grow side by side with these in warmer latitudes will not *grow* here at all, but merely exist. *Laportia gigas*, the great stinging tree, of which I have sent samples of fibre from plants which never attain in this garden more than 4 feet in height, being cut down by frost every winter; yet I have seen it, beside the flame-tree in the brush lands of Queensland and New South

Wales, attaining a height of 75 feet, and with a trunk more than 5 feet in diameter.

The *Pipturus propinquus*, *Sterculia rupestris*, *Sida retusa*, and many others, grow as quickly here as in Queensland. Quite as good results, therefore, might be expected by cultivating these plants; but need we go further than our own colony of Victoria for quality or quantity of fibre or paper material, when our forests teem with valuable plants suitable for their manufacture? If we only instance the *Pimelias*, *Dianellas*, *Plagianthus*, *Cladiums*, *Lepidosperma*, or "Mat-grass," *Commersonia*, *Brachychiton populneum*, *Urtica incisa*, *Cyperus*, *Typha*, *Scirpus*, *Carex*, *Isolepis*, and the rushes (*Juncus vaginatus*, *maritima*, and *pauciflora*), and there are scores of other indigenous plants equally valuable, *rags* need no longer be collected for paper-making, or introductions from other countries for cordage. With sixty millions of acres of good land included between the parallels 30° and 39° south latitude, we can, without cultivation, reap abundant harvests of paper material, even from various species of *Eucalypti*, *Xerotes*, *Melaleuca*, *Cyperus*, and others; and, indeed, from some of the grasses which are plentiful in their midst. Our native vegetable resources are great, and should therefore be thoroughly searched up. My thirty crude samples of paper, which are sent in frames, were prepared under great difficulties; and they were only made to prove what can be done with some of our native plants. Many of them are new; but the indefatigable Mr. Ramsden, of the Victorian Paper Mills, has devoted his attention particularly to the manufacture of paper from Victorian plants; and he will, no doubt, be able to add to his collection long before the colony has been thoroughly explored.

The dyes, forwarded in bottles, are not so numerous as they would have been had time permitted me to send out collectors; but the samples of silk, calico, and woollen material stained with them show a variety of beautiful colors; the value of which will, no doubt, be proved at Philadelphia.

I regret to have to say that my collection of woods could not be properly seasoned. Some of them were polished within a week after they were cut from the tree: consequently many of the specimens have split from end to end.

I have the honor to be, gentlemen,

Your obedient servant,

WILLIAM R. GUILFOYLE,

Director of Botanic Gardens, Melbourne.

The display of blank and account books (Class 261) was remarkably good. From Europe were specimens of books made up of very strong and excellent paper (principally hand-made), with most solid covers, sheathed with metal over the wearing parts, closed with lock and key, and in every respect admirable. These were few; and the foreign display was confined to France, Italy, Germany, and Russia, — doing much credit to all. The American blank-book manufacturers, especially, but not exclusively, those nearest to the Exhibition, in this city, made very large and handsome exhibits. On the merits of these I prefer to give the words of Mr. G. W. Seitz, of Germany, my associate judge, who writes: "The binding of books, as well as the manufacture of blank-books, are, as to solidity and execution, decidedly the best that I have seen in the Exhibition."

The manufacture of papers belonging to Class 263 (building papers) has vastly increased within a few years, and many new applications of them have been made. The quality, also, has improved by the use of hemp and manilla in much larger quantities. These papers are used natural, or saturated with bitumen, and are sometimes printed either in water or oil colors. They cover roofs and floors, line inside walls, protect outside walls, line cisterns, underlie carpets, displace mattings and oil-cloth, dispense with lathing and plastering, and find a number of uses that increases every year. This increase is good evidence of their economy and utility; and the exhibits were, in the order of their quality and extent, from, first, United States; second, Sweden; third, Japan; fourth, France. The Japanese papers of this character were the strongest and best shown; being made principally of mulberry bark, and enamelled with oil-colors and varnish, in the most perfect and durable manner. These were floor-papers only, and the various other species of building papers shown by other countries were not shown by Japan.

Very little Japanese paper is made from rags or linen or cotton fibre; but most is made, in a primitive way, of materials obtained from plants which are specially cultivated for the manufacture of paper, and for no other purpose. The most important of these plants is the *Kodzu*; then comes the *Gampi*, the *Mitsumata*, the *Kuwa* (or mulberry-tree), the *Hi-no-ki* (a species of wild cherry), and several others unknown to us. It is the bark only of these shrubs and trees that is used, and not the woody fibre. The better qualities of paper are made in workshops arranged for that special purpose; but most of the paper is home-made by farmers at times when their fields do not require their whole attention. Such paper as we are accustomed to see is

manufactured from rags, and only in the regular paper-mills recently built at Tokis, and which are provided with foreign machinery.

Of Class 264, embracing wall and other ornamental papers, there was an excellent display; and it is much to be regretted that France, who notably excels in the manufacture of these kinds of paper, sent none of her best wall-papers to the Exhibition. But one notable display came from Great Britain, and it might well serve for a suggestive model to our designers of decorative paper. Sweden showed specimens from several of her principal manufacturers; among which, rich and bright designs in velvet and colors were numerous. Warm colors predominated; and the patterns not suitable to American taste indicated the climate of the country from which they came, and would seem to accord well with a refined taste, modified by the protracted winters of the far North. Italy presented a very beautiful book of patterns from Naples, that was in keeping with the well-known Italian artistic taste. The ancient frescoes on the recently uncovered walls of Pompeii were there reproduced with accuracy; and the finest *minutiæ* of all the designs had received great care and pains. These papers were well worth the study of our producers of paper decorations, and might aid in forming a true and high artistic taste. What principally distinguishes the European wall-papers, generally, from those of this country is, that the former are mostly made up of specific designs, each being complete in itself, that court inspection and study, the general effect being subordinate to the particular excellences of the parts; while, in the American papers, the general effect is principal, shades and designs more blending, and the finished details of the finest papers of Europe wanting. This general effect aimed at by our manufacturers is not too much at the expense of *minutiæ* for the prices that they are able to obtain; and it is certainly admirably produced according to their aim. Any other style would not meet their market; and their efforts are naturally put forth to protect the styles that will. There are exceptions to this rule; and in one of the principal American exhibits there were perfect and cheap copies of very fine foreign designs. Nothing is here meant in disparagement of American designs; for differences in taste are frequently radical, and due to unalterable characteristics of a people. The American machinery for printing wall-paper has reached great perfection; and more than twenty colors are sometimes printed from as many cylinders, during one continuous operation. Very handsome specimens of decorative paper were to be seen in the German Department; and Russia presented quite a number, some of which were peculiar and quite attractive. From the Netherlands came imi-

tations, on paper, of fine and variegated marbles, of ornamental woods, and of inlaying of woods of various textures and colors, that were very perfect, and quite superior to any thing of the kind found elsewhere. Correct Flemish taste and patient labor were conspicuous in these elaborate imitations. Suspended from the walls of the office of the Commissioners from Belgium were admirable imitations, in heavy embossed paper, of the old leather hangings of Molines and Cordon. So perfect were they that close inspection only could satisfy one that remnants of these famous leather ornaments were not before him.

Of ornamented papers for bookbinders' use, a very fine exhibit came from New York; and two exhibitors, from Austria and Bavaria respectively, presented books of patterns, of marbled and other fancy papers, that seemed absolutely perfect of their kind. If these could be purchased and retained in the United States, they might in the future contribute largely to the perfecting of the products of our book-binderies.

In paper-making machinery there were few exhibits, — all American. In this branch of manufacturing, Americans are not excelled; and this may partly account for the absence of foreign exhibits in it. Machinery of this kind, too, is heavy, and expensive to handle; and could not naturally be expected from abroad, when no hope of prospective remuneration is entertained. An entire paper machine was in operation in Machinery Hall, erected and run at great expense by the builder. This was critically examined by practical judges, and deemed to be excellent in all its details. It contained some important improvements, and manifests in the builder an ambitious and intelligent desire to accomplish real progress. The demand in this country for highly-finished book-paper has wrought great improvement in apparatus for super-calendering in the web; and the several exhibits made of such would seem to indicate that nothing much more complete need reasonably be looked for. One most important improvement in calendering machinery is of the last ten years; and consists in a stack of from eight to twelve small rolls, not of ordinary cast-iron (as of old), but of chilled iron, with surface as hard as steel. Three exhibits of these were brought from Wilmington, Delaware, in which each roll was separately ground, and polished so accurately that the faintest glimmer of light could not pass between any two rolls when put together. So great is the accuracy attained by the new processes of single polishing, that any two rolls of all these exhibits might be placed together, and touch each other throughout the entire lengths.

The envelope machines were equally interesting and satisfactory;

and a most important addition has been made to these within a few years. Formerly, the blanks for folding were run out by hand; and the flaps that are finally closed were gummed by a brush, and dried. This was to allow the machine to make up and press together the envelopes without an adhering of the last flap. The latest improvement permits the whole envelope to be gummed by machinery at one process; after which, it is carried some minutes through the air to dry the last flap before counting and banding. This is perfectly well accomplished, and considerable labor saved thereby. One machine cut the envelopes automatically from narrow rolls, with a minimum waste of paper; and a cheapening of the product seemed to be effected to a considerable extent by this feature. Envelopes made by the machines exhibited were very perfect, and made with great economy; and it is probable that there is little room for further improvement in that line.

One of the most important parts of our labors was the examination of articles included in Class 540, which embraces all kinds of printing-presses. This was a study of the "art preservative of all arts;" and all progress made in it ought to be important to the progress of mankind. A great number of presses for various purposes, including roller-presses for bank-note work, were exhibited; many of which were kept in pretty constant operation. Most of these were American; and the most notable foreign presses were from England, France, and Germany,—all of the very best character. The immense issues of the principal newspapers of the large cities of Europe and America, and the few short hours in which they have to be printed, have demanded new facilities and greater rapidity of printing than was possible by feeding sheet by sheet. Within a few years only, this demand has been supplied; and presses now take the paper in large, continuous rolls, pass it rapidly between cylinders covered with circular stereotyped plates, print both sides in quick succession, divide the broad web into two running sheets, cross-cut them precisely in the middle of the margins, fold each sheet neatly twice, and deposit all in rows at the rate of over twenty thousand newspapers per hour. A printing press of this character deserves to rank among the greatest feats of mechanic art; and the three exhibited, for many months drew crowds of observers, and were universally recognized as being among the wonders of the Exhibition. These three were, the Walter press from England, exhibited by Mr. Walter, of the "London Times;" the Hoe press from New York, exhibited by R. Hoe & Co.; and the Bullock press from Philadelphia, exhibited by the Bullock Press Company. The latter company boldly placed in competition a press of unusual

width, and printed two sheets at a time of the "New York Herald," on a roll of paper sixty-three inches wide. The web of double width was then rapidly slit in two, and cross-cut into separate sheets. The Hoe press was also double, and printed two sheets at a time of the "Philadelphia Times," on a roll of paper fifty-two inches wide, which it then slit and cross-cut, after which it carried the separated sheets forward for an additional operation. This was the folding; and the process was effected by two folders, one on each side, folding each sheet twice, and delivering it with absolute exactness, without a single fault. The Walter press was narrower, and printed a single sheet of the "New York Times," on a roll of paper thirty-six inches wide, which it cross-cut and delivered flat. Its speed was greater than that of the wider presses, and the work of each was admirably done. The following is a summary of the competitive trial:—

Walter Press. — Printed "New York Times," size $36 \times 46\frac{1}{2}$: web of paper, thirty-six inches wide; number of impressions in an hour, 10,455; number of running yards printed in an hour, 13,486; number of square yards printed in an hour, 13,486.

Hoe Press. — Printed "Philadelphia Times," $26 \times 27\frac{1}{2}$: web of paper, fifty-two inches wide; number of impressions in an hour, 21,810; number of running yards printed in an hour, 11,359; number of square yards printed in an hour, 16,401; slit the web and folded the sheets twice.

Bullock Press. — Printed "New York Herald," size $31\frac{1}{2} \times 45\frac{1}{2}$: web of paper, sixty-three inches wide; number of impressions in an hour, 14,856; number of running yards printed in an hour, 9,388; number of square yards printed in an hour, 16,372; slit the web, after printing, into two sheets.

For further particulars of this remarkable trial of merit, I refer to the letter of Sir Sidney H. Waterlow, Bart., M.P., of London, one of my associate judges, — a gentleman eminently qualified to judge of the merits of printing-presses, and who gave to those of the Exhibition a special and careful examination. The letter contains, also, general observations upon the printing-presses of various kinds exhibited, that are very valuable, and that should be publicly presented to that part of the community interested in such information.

I much regret not being able at this late day (September 6) to see the Campbell roll-press in practical operation. At several appointed times, we met to see this press operating; but were always disappointed in our expectations. Great simplicity and originality are shown in its general plan; and there is a reaching after effects through almost

invariably new devices. The press on exhibition shows perhaps the highest aims yet held by the inventor; and I am far from uttering any words in disparagement of it, simply because the builder has not yet been able to overcome all the difficulties that stand in the way of perfect success. What we have seen is unquestionably a work of genius; and I cannot resist the persuasion that it will yet attain a marked success.

The exhibition was rich in beautiful typography; but nothing absolutely new was noticeable, except a plan for cheaply and rapidly composing titles and scripts in letters and designs of the highest and most elaborate art. This was submitted by the Bureau of Engraving and Printing, in the United States Treasury Department, as an invention of G. W. Casilear, in charge of the engraving division. It is a plan only feasible in large and first-class establishments, where the highest art and skill can be commanded for the execution of original letters and designs to be repeated; but it enables such establishments, by laying in a large store of the most perfect originals, to compose the titles and scripts of bonds, checks, certificates, billheads, &c., by cheaply transferring and combining these originals, instead of separately engraving every design and script that they may have to produce in the course of a large and miscellaneous business.

Several "protective" papers were submitted for our inspection and report; viz., "The National Safety Paper," the "Commercial Safety Paper," and a paper printed with Francis & Loutrel's sensitive ink. These are specially designed to prevent the alteration of checks and other evidences of value, and are all based upon the same idea; viz., a sensitive coloring that will be destroyed by any agent, chemical or unchemical, that discharges or erases the writing upon the paper, — thus affording evidence of any tampering with the instrument. The papers of each party written upon were submitted to a rival; and, according to the best judgment of the examiners, all were fairly altered. I have always held that such devices are so many steps in the right direction, as tending to multiply and complicate the difficulties to be overcome by the forger and counterfeiter; yet, on the other hand, it is rationally maintained that any device publicly claimed to afford certain protection, and sometimes failing to give it, positively misleads the public, by leading men to rely upon a false security. Certain it is, that men who practise fraud by raising checks are skilful experts, and may be safely matched against men of science in honorable callings; yet these find in no safety-paper submitted absolute defence against alteration. Of this fact we were assured by Dr. Charles M. Cresson, of this city

who stated to us, in the presence of representatives of several protective papers, that he had found none able to prevent him from altering a writing without changing the paper. It is not to be supposed that invention in this direction is exhausted, and that a partial failure — a failure to be simply perfect — is a total failure. The best that has been accomplished is very creditable, and narrows down the number of forgers to chemical experts; and enough is accomplished to promise more in the future.

The administration of the Exhibition can be congratulated upon the number and quality of articles submitted to our group of judges. They were indeed too numerous and important to have full justice done them by our best efforts. Our reports recommending awards for merit are not few, and attest our desire to be as just as possible to those many men of uncommon intelligence and earnestness who have expended so much time, money, and pains to contribute their productions as a part of the American Centennial Exhibition. Where we have erred in our judgment, it is probable that we have erred upon the side of liberality.

Respectfully yours,

JAMES M. WILCOX,

President of Group XIII.,

Judges of the International Exhibition.

AWARDS TO AMERICAN EXHIBITORS.*

GROUP VIII.

JUDGES.

American.

EDWARD ATKINSON, <i>Secretary</i>	Boston, Mass.
HUGH WADDELL, Jr.	Savannah, Ga.
Col. EDWARD RICHARDSON	Jackson, Miss.
A. D. LOCKWOOD	Providence, R. I.
CHARLES H. WOLFF	Cincinnati, Ohio.
Col. SAMUEL WEBBER, C. E.	Manchester, N. H.
GEORGE O. BAKER	Selma, Ala.

Foreign.

ISAAC WATTS, <i>President</i>	Great Britain.
W. W. HULSE, C. E.	"
DON ALVARO DE LA GANDARA	Spain.
Major ARNOLD GOLDY	Switzerland.
Prof. GUSTAV HERRMANN	Germany.
Prof. JOSEPH DASSI	Italy.
MENI RODRIGUES DE VASCONCELLOS	Portugal.



COTTON, LINEN, AND OTHER FABRICS, INCLUDING THE MATERIALS AND THE MACHINERY.

1. CLASS 228. — Woven fabrics of mineral origin.
2. Wire cloths, sieve cloth, wire screens, bolting cloths. Asbestos fibre, spun and woven, with the clothing manufactured from it. Glass thread, floss and fabrics.
3. CLASS 229. — Coarse fabrics, of grass, rattan, cocoa-nut, and bark.
4. Mattings — Chinese, Japanese, palm-leaf, grass and rushes. Floor cloths, of rattan and cocoa-nut fibre, aloe fibre, &c.
5. CLASS 665. — Cotton on the stem, in the boll, ginned, and baled.
6. CLASS 666. — Hemp, flax, jute, ramie, &c., in primitive forms and in all stages of preparation for spinning.
7. CLASS 230. — Cotton yarns and fabrics, bleached and unbleached.
8. Cotton sheeting and shirting, plain and twilled.
9. Cotton canvas and duck. Awnings, tents.

* The Awards not appearing in the list following, will be found in another part of the volume, with the claims of the parties having received them, attached to the same.

10. CLASS 231. — Dyed cotton fabrics, exclusive of prints and calicoes.
11. CLASS 232. — Cotton prints and calicoes, including handkerchiefs, scarfs, &c.
12. CLASS 233. — Linen and other vegetable fabrics, uncolored or dyed.
13. CLASS 234. — Floor oil-cloths, and other painted and enamelled tissues, and imitations of leather with a woven base.
14. CLASS 521. — Machines for the manufacture of cotton goods.
15. CLASS 523. — Machines for the manufacture of linen goods.
16. CLASS 524. — Machines for the manufacture of rope and twine, and other fibrous materials not elsewhere specified.



ARKANSAS.



Wm. Taylor, Phillips County, Arkansas.

RAW COTTON (10) COMMERCIAL BALE.

Report. — Commended for extraordinary fineness, silky appearance, good staple, and excellent ginning.



CONNECTICUT.



Falls Company, Norwich, Connecticut.

COTTON AWNINGS AND TICKINGS.

Report. — Awning stripes, wide-striped tickings, commended for excellent fabric and color of awning stripes, clear white and blue in tickings, and great smoothness in stripe and texture.



Palmer Patent Tenting and Drying Machine Company, Norwich,
Connecticut.

MACHINES FOR STRETCHING, STRAIGHTENING, AND DRYING TEXTILE
FABRICS.

Report. — Commended for originality, utility, and completeness of machine; excellence of construction, fitness for the purposes intended, adaptation to public requirements and economy.



Willimantic Linen Company, Hartford, Connecticut.

SPOOL COTTON, FINE YARNS, AND MACHINES FOR WINDING AND
TICKETING SPOOLS FOR SEWING THREADS.

Report. — Commended for originality and completeness of system,

excellence of machinery and appliances, the winding frame being the invention of Hezekiah Conant; and for superiority and economy of production, also, excellence of material, and variety of colors of threads.

Woven Wire Mattress Company, Hartford, Connecticut.

WIRE MATTRESSES.

Report. — Commended for excellence in strength, peculiar weaving, adaptation, economy, great durability, novelty of production.

Neptune Twine Mills, Emory Johnson, East Haddam, Connecticut.

TWINE AND CORD.

Report. — For peculiar, even, and strong seine twine and other cords.

Shetucket Manufacturing Co., Norwich, Connecticut.

SHIRTING STRIPES.

Report. — Undressed, well-made throughout, and good color.

Palmer & Kendall, Middleton, Connecticut.

COLORED MOSQUITO NETTINGS AND CANOPIES.

Report. — Commended for excellence of color and material, equality and proper size of meshes, straight edges, smooth finish, flexibility.

Wauregan Mills, Wauregan, Connecticut.

COTTON FABRICS.

Report. — Commended for the special merit of their fabrics, known as the "Wauregan 100's."

Pocahontas Manufacturing Co., Putnam, Connecticut.

COTTON FABRICS.

Report. — Half-bleached and bleached cottons, of medium grade, made and finished for durability.

Ponemah Mills, Taftville, Connecticut.

COTTON FABRICS.

Report. — Commended for the excellence of their fine printing cloths.

DELAWARE.

J. Morton Poole, & Co., Wilmington, Delaware.

CALENDER ROLLS.

Report. — Commended for excellence of finish, beauty of the articles exhibited, as well as the superior quality of the material.

Jas. Riddle, Son, & Co., Wilmington, Delaware.

TICKINGS.

Report. — Variegated colors and plain blue striped, commended for excellence in twill and colors; double warp, 104 picks, pure cotton, peculiarly novel fabric.

GEORGIA.

Alabama and Georgia Manufacturing Co., West Point, Georgia.

COTTON FABRICS.

Report. — Commended for the great excellence and durable quality of their heavy standard sheetings.

INDIANA.

Evansville Cotton Manufacturing Co., Crescent City Mills, Evansville, Indiana.

COTTON FABRICS.

Report. — Heavy sheetings, made from good stock, even, well carded, and excellent in all respects.

LOUISIANA.

S. N. Drake, New Orleans, Louisiana.

DRAKE'S PATENT COTTON TIES.

Report. — Commended for the simplicity, effectiveness, and applicability to purpose, of the hoop-iron stamped and slotted ties for baling cotton.

Adam Kellogg, Kellogg's Landing, Louisiana.

RAW COTTON (20) COMMERCIAL BALE.

Report. — Commended for extraordinary strength of staple, brightness of color, and good handling.



MAINE.



Hill Manufacturing Company, Lewiston, Maine.

COTTON FABRICS.

Report. — Commended for uniformity in the quality of their fabrics.

Barker Mills, Auburn, Maine.

COTTON FABRICS.

Report. — Commended for special evenness of yarn and excellence of weaving in their brown and bleached fabrics.

Farwell Mills, Lisbon, Maine.

BLEACHED AND UNBLEACHED COTTON, SHEETINGS, AND SHIRTINGS.

Report. — For uniform texture and excellent finish.

Westbrook Manufacturing Co., Portland, Maine.

COTTON DUCK.

Report. — Commended for great excellence in texture and uniform good finish.

Saco Water Power Machine Shop, Biddeford, Maine.

MULE SPINNING, DRAWING, AND ROVING MACHINES.

Report. — Commended for originality, utility, and excellent quality of the machines, and for the great consideration given to the details.

Lewiston Machine Company, Lewiston, Maine.

THOMAS POWER LOOMS AND WARPING MACHINE.

Report. — Commended for ingenuity, skill, quality, economy, and fitness of machines for the production of plain and fancy fabrics, seamless bags.

Bates Manufacturing Co., Lewiston, Maine.

SATEENS, GINGHAMS, AND HONEYCOMB QUILTS.

Report. — Sateens, admirable assortment of colors and excellence

of finish, in all respects. Corded fancy-woven and high-colored fabrics, commended for novelty and excellence in quality and fabric.

Bates Manufacturing Co., Lewiston, Maine.

COTTON FABRICS.

Report. — Commended for general excellence in the style and design of Marseilles and crochet quilts, and of their fancy-woven white goods.

Androscoggin Mills, Lewiston, Maine.

COTTON FABRICS.

Report. — Commended for the excellence of their seamless bags; the even, smooth texture of their wide sheetings, of the higher grade, and for the general uniformity of their fabrics.

MARYLAND.

Druid Mills, Baltimore, Md.'

COTTON SAIL DUCK.

Report. — Commended as clean, well manufactured, even, and fit for its purpose.

The Mt. Vernon Co., Baltimore, Md.

COTTON DUCK AND TWINE.

Report. — Commended for the strength and utility of their wide duck, for car roofs and other purposes, and for the even good quality of their twine.

MASSACHUSETTS.

Peter Lawson, Lowell, Mass.

IMPROVED COMPOSITION DRAWING OR ROVING CAN.

Report. — Commended for lightness, strength, handiness, and cheapness, as compared with the ordinary can.

Foss & Pevey, Lowell, Mass.

UNDER FLAT COTTON CARD.

Report. — This machine has peculiarities of construction which are original.

Richard Kitson, Lowell, Mass.

COTTON OPENERS AND LAPPER AND SHODDY PICKER.

Report. — Commended for originality of invention in opener and in elastic beaters, as well as for general good workmanship and utility in all machines,

David McFarland, Worcester, Mass.

CARD-SETTING MACHINE.

Report. — Commended for simplicity and excellence of machine, and for the good quality and economy of the work done by it.

A. B. Prouty, Worcester, Mass.

CARD-SETTING MACHINE.

Report. — Commended, because the machine possesses the important features of novelty and utility, combined with simplicity of arrangement and action, and excellent construction. The work produced is superior in quality and economical in cost.

John G. Avery, Worcester, Mass.

THREAD, TWINE, AND CARD MACHINERY.

Report. — Commended for originality, perfection, and utility of machinery, fitness for the purposes intended, quality of products, and economy of working.

Clinton Wire Cloth Co., Clinton, Mass.

WIRE FIRE-PROOF LATHING, FENCING SCREENS.

Report. — Commended for excellence of workmanship, utility, and strength; especial note taken of the wire lathing as a means of protection from fire.

Wakefield Rattan Co., Wakefield, Mass.

RATTAN GOODS.

Report. — Commended for variety, novelty, utility, and unsurpassed excellence.

Gayle & Co., Boston, Mass.

TENTS.

Report. — Commended for excellence in the employment of an expanding and folding frame for distending the upper part of a tent; very novel and adapted to all out-of-doors purposes, where lawn, beach, hunter's, and camp tents are used; quick folding against sudden storms

or strongly fortifying all sides, enabling them to stand against wind or rain; economy and adaptation.

**Methuen Co., Webster Mill, and Nevens Bag Mill, Nevens & Co.,
Boston, Mass.**

HEAVY BAGGING MADE FROM JUTE.

Report. — Commended for even texture and adaptation to use; good manufacture and closeness in the web.

Geo. W. Chipman & Co., Boston, Mass.

CARPET LININGS AND STAIR PADS.

Report. — Commended for excellence in all the following properties, — elasticity, softness, overcomes unevenness in the floor, warmth in winter, coolness in summer, waterproof, preventing water from leaking through floors and ceilings. Made with such excellence in seaming, lapping both in the ordinary selvage of sewing and a tape strip as to prevent the inner material from working or ravelling out. Cedrinated carpet linings is anti-moth and anti-insect in its medicated properties, free from oil or oily substance attracting mice or vermin of any kind. A solution of sugar of lead also prevents mildew. The entire exhibit very full and satisfactory; strictly A 1.

Mayall Manufacturing Co., Boston, Mass.

PATENT ANTI-MOTH CARPET LINING.

Report. — The cotton is pressed with an anti-moth preparation and dried thoroughly on hot cylinders; full 36 inches wide perforation of the lining, 1 ply cloth, and 20 per cent paper besides the cotton; the perforation is made to allow the dust to settle on the floor; specially adapted to hotels and public buildings. Commended for excellence.

Stevens Linen Co., Webster, Mass.

BLEACHED AND BROWN LINEN FABRICS.

Report. — Commended for superior excellence, in quality and utility, of their plain and twilled, crash towelling, diapers, and huckabucks.

Hamilton Manufacturing Co., Lowell, Mass.

PRINTED CALICOES.

Report. — Commended for excellence in design, coloring, and execu-

tion, in chintz styles on wide cloth and robes ; and for aniline combinations with madder colors.

Hamilton Woollen Co., Southbridge, Mass.

PRINTED COTTON FABRICS.

Report. — Commended for novelties in design and neatness of execution, good coloring, good printing of their “Knickerbocker” percales and cambrics.

Merrimac Manufacturing Co., Lowell, Mass.

PRINTED COTTON FABRICS.

Report. — Commended for especial and superior excellence and novelty in “Cardinal Reds,” for beauty and excellence in design and coloring, in printed furniture cretonias ; and for excellence in madder purple and shirting stripes.

Dwight Manufacturing Co., Chicopee, Mass.

COTTON FABRICS.

Report. — A full exhibit of fine fabrics, bleached and unbleached, of special excellence in all respects.

Tremont & Suffolk Mills, Lowell, Mass.

COTTON FABRICS.

Report. — Commended especially for the flexibility and uniformity of their medium cotton flannel, and for serviceable sateen jeans.

Boston Manufacturing Co., Waltham, Mass.

COTTON FABRICS.

Report. — Firm, strong, and thoroughly well manufactured medium fabrics, of special excellence.

Boott Cotton Mills, Lowell, Mass.

COTTON FABRICS.

Report. — Commended for the excellence and even weaving of their cords and extra drills.

Chicopee Manufacturing Co., Chicopee, Mass.

COTTON FABRICS.

Report. — Commended for extra fine and extra heavy cotton flannel.

nel, of very superior quality; also, for the firm and uniform quality of their heavy $\frac{1}{4}$ sheeting, even and well made in every respect.

Wamsutta Mills, New Bedford, Mass.

COTTON FABRICS.

Report. — Commended for uniformity, excellence, and purity of their well-known fabrics.

MISSISSIPPI.

Mississippi Mills, Wesson, Miss.

COTTONADES, OSNABURG PLAIDS.

Report. — The material is excellent, coloring thoroughly well done, for durability remarkable.

Whitfield Manufacturing Co., Corinth, Miss.

COTTON YARNS.

Report. — Cotton yarn, of excellent quality, produced directly from the seed cotton, without the use of the ordinary gin, by an equivalent apparatus attached to the card.

Ben. Montgomery (colored), Warren County, Miss.

RAW COTTON (17) COMMERCIAL BALES.

Report. — Commended for very extraordinary length of staple and good handling.

NEW HAMPSHIRE.

Monadnock Mills, Claremont, New Hampshire.

COTTON FABRICS.

Report. — Commended for the excellent quality of the Marseilles quilts, and their adaptation to popular wants.

Great Falls Manufacturing Co., Great Falls, New Hampshire.

COTTON FABRICS.

Report. — A very full assortment of thoroughly well manufactured goods; well prepared and finished for service, both bleached and unbleached.

Morse, Kaley, & Co., Milford, New Hampshire.

COTTON YARNS.

Report. — Commended for the excellence and adaptability to purpose of their white and colored knitting cotton.

Stark Mills, Manchester, New Hampshire.

COTTON FABRICS.

Report. — Commended for very even spinning and weaving in their heavy standard sheetings, and for the very superior quality of their seamless bags.

J. A. V. Smith, Manchester, New Hampshire.

TUBULAR STEEL SPEEDER FLIERS.

Report. — Commended for lightness, strength, quality, and fitness of the fliers to the purposes intended, and saving of power.

Eaton & Ayer, Nashua, New Hampshire.

BOBBINS, SPOOLS, SHUTTLES, AND SKEWERS, FOR SPINNING AND WEAVING.

Report. — Commended for good quality and workmanship. There are also features of novelty and utility in the self-threading shuttles, and in the iron rings applied to spinning bobbins, for the Sawyer & Rabbeth spindles, and, also, to roving bobbins.

NEW JERSEY.

Robert Adams, Paterson, New Jersey.

DYED MOSQUITO NETTINGS.

Report. — Commended for smoothness, strength, brightness, and evenness in coloring.

George Stratford, Jersey City, New Jersey.

OAKUM.

Report. — Commended for excellent quality and softness of texture.

Wortendyke Manufacturing Co., Wortendyke, New Jersey.

COTTON LAMP WICKING.

Report. — Commended for the good quality and softness of their products.

Gloucester Gingham Mills, Gloucester, New Jersey.**GINGHAM DRESS GOODS.**

Report. — Commended for good quality, nice designs.

G. De Witt, Brothers, & Co., Bellville, New Jersey.**VENTILATED ELASTIC BREAST PADS, FINE BRASS WIRE THREAD,
FINE WIRE CLOTH.**

Report. — Commended for excellence in material, flexibility in the combination of brass wire and cotton threads, utility, and economy. One coil brass wire, five miles long, weighs one pound; wire cloth 10,000 holes or meshes per square inch.

R. D. Wood & Sons, Millville, New Jersey.**CALENDER FOR COTTON GOODS.**

Report. — Commended for good workmanship, material, and fitness for the intended purpose.

William Crabb, Newark, New Jersey.**HACKLES, CARD CLOTHING, WOOL COMBS, PICKER TEETH, COMB
PINS, GILLS, &c.**

Report. — Commended for superior quality and utility of all the numerous articles exhibited, and fitness for their respective purposes.

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NEW YORK.

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J. & W. Lyall, New York, N. Y.**POSITIVE-MOTION LOOMS, FOR CORSETS, CANVAS, SEAMLESS BAGS,
JUTE CARPETS, COTTON SHEETINGS, &c.**

Report. — Commended for the variety, extent, and importance of the looms; invention of the positive motion, its wide range of applicability, fitness for the purposes intended, excellence of design, construction, and working utility and economy.

The Utica Steam Cotton Mills, Utica, New York.**COTTON SHEETINGS AND SHIRTINGS, UNBLEACHED AND BLEACHED.**

Report. — Commended as a fabric in various widths, of great excellence in texture and general finish.

Wm. Horrabin, Cohoes, New York.

ANTI-FRICTION TOP ROLLERS.

Report. — Commended for excellent quality and fitness for the intended purposes, with economy of cost and use.

J. Wilde & Co., New York, N. Y.

COCOANUT FIBRE CARPETS.

Report. — Striped and plain carpet, of unusual evenness and general excellence.

American Linoleum Manufacturing Co., New York, N. Y.

LINOLEUM FLOOR CLOTH.

Report. — Commended for the beauty and finish of their designs and colors, and excellent qualities of the cloth.

Lawrence, Waterbury, & Co., New York, N. Y.

JUTE BAGGING.

Report. — Commended for its very excellent manufacture and its adaptability to baling cotton.

American Linen Thread Co., Mechanicsville, N. Y.

LINEN THREAD AND YARN.

Report. — Commended for smoothness, evenness, and excellence, in all respects, of their flax products, of American manufacture.

McCrosen & Fair, New York.

COTTON HANDKERCHIEFS.

Report. — Commended for style, finish, color, and quality.

Walcott & Campbell, New York Mills, New York.

COTTON FABRICS.

Report. — Fine bleached cottons, firm, uniform, well bleached and finished, of very superior quality.

OREGON.

—◆—
Parrish & Miller, Jefferson, Oregon.

FLAX IN THE STRAW AND LINT.

Report. — Commended for extraordinary length, great strength, superior gloss, and silky softness.

—◆—
State of Oregon.

FLAX.

Report. — Very fair quality, considerable strength, good color, and well prepared.

PENNSYLVANIA.

—◆—
Thomas Wood, Philadelphia, Pa.

POWER LOOMS AND WINDING MACHINES.

Report. — Commended for excellent construction, numerous features of novelty, simplicity, and utility, facility for working, economy of labor in attending, cheapness, and quality of work produced.

—◆—
R. T. White & Son, Philadelphia, Pa.

CARPET WARPS.

Report. — Commended for general good quality.

—◆—
Albion Print Works, Conshohocken, Pa.

DYED AND PRINTED COTTON FABRICS.

Report. — Commended for great variety of color and excellence of dyeing and finishing, both in solid colors and plain black for suitings.

—◆—
Sellers Manufacturing Co., Philadelphia, Pa.

WIRE CLOTH FOR PAPER MACHINES.

Report. — Commended for excellence in quality of material and workmanship; very heavy and flexible; 72 inches wide, 36 feet long.

—◆—
E. Darby & Son, Penn Wire Works, Philadelphia, Pa.

WIRE GOODS IN VARIETY AND NOVELTY.

Report. — Novelty in trellises, bird cages, flower stands, and cases;

garden fencing. Commended for general excellence in design, material, and manufacture.

Claghorn, Herring, & Co., Philadelphia, Pa.

RAW COTTON IN VARIETY.

Report. — The best exhibit of commercial bales of raw cotton from all parts of the world; also, cotton in the seed and on the plant.

Garsed Bros., Frankford, Pa.

TICKINGS.

Report. — Commended for superior quality, brilliancy in colors, strength of cloth.

David Trainer & Sons, Omego Manufacturing Co., Linwood, Pa.

TICKINGS.

Report. — These tickings are strictly first class, and excel in Her-ringbone twill. Commended for fineness of yarn, peculiarly good class.

John Faman & Co., Conestoga Steam Mills, Lancaster, Pa.

TICKING.

Report. — 60 inch wide; specially noteworthy. Commended for excellence of materials, color, and weaving good variety.

Thomas Potter, Sons, & Co., Philadelphia, Pa.

OIL CLOTH.

Report. — Commended for their very great variety, excellent quality, numerous, original, and artistic designs, rich finish, and colors admirable in every way.

S. Thornton & Sons, Philadelphia, Pa.

COLORLED COTTON GOODS.

Report. — Commended for farmers' and miners' cotton checks; excellence of color and fabric; well designed in styles, and very durable.

Conestoga Mills, Lancaster, Pa.

DYED CANTON FLANNELS GENUINE NANKEENS.

Report. — Commended for variety and beauty of colors; smooth, strong, and fine fabric, specially in silky finish; durability; genuine nankeens, excellent in quality of cotton and fabric.

Wm. Simpson & Sons, Philadelphia, Pa.

PRINTED AND DYED COTTON FABRICS.

Report. — Commended for great variety, novelty, and excellence in design and execution, in mourning and half-mourning prints, ultramarine blue, garancine chocolate, and dyed calicoes, in solid black alpaca finish; and for regularity and evenness of fabrics.

Pretty, Grimes, & Co., Philadelphia, Pa.

PRINTED AND DYED COTTON FABRICS.

Report. — Commended for excellence in dyed "solid blacks" in logwood and aniline; and neatness in design and clearness of execution, in half-mourning prints.

Andreas, Hartell, & Co., Pennypack Print Works, Philadelphia, Pa.

PRINTED CALICOES AND SHIRTINGS.

Report. — Commended for excellence in "imitation oil colors" in reds and greens; and prints in imitation of "German ginghams" and dress goods.

Wood & Haslam, Philadelphia, Pa.

DYED COTTON YARNS AND FABRICS.

Report. — Commended for excellence in color and design in Turkey red yarns and table cloths.

David S. Brown & Co., for the Gloucester Manufacturing Co. and the Ancana Printing Co., Philadelphia, Pa.

PRINTED COTTON FABRICS.

Report. — To the Gloucester Manufacturing Co., for excellence in design, colors, and execution in mourning prints, shepherds' plaids, and shirtings. To the Ancana Printing Co., for variety and excellence, especially in light chintzes, striped percales in high colors, handkerchiefs, flags, oil black and lavender prints and aniline black calicoes, with figures in steam colors, and also for polonaise suitings.

Millville Manufacturing Co., Philadelphia, Pa.

SILESIA, WINDOW HOLLANDS, UMBRELLA CLOTH.

Report. — Specialty, fine colors, fabrics of good finish.

Millville Manufacturing Co., Philadelphia, Pa.

SPECIAL COTTON FABRICS.

Report.—Commended for excellent Tillott cloth; also for tracing muslin, superior in quality, and waterproof to be used with ink or pencil.

RHODE ISLAND.

Peabody Mills, Providence, R. I.

COLORED COTTON GOODS, COLORED PRINTS, AND COLORED SUITINGS.

Report.—Commended for superiority of fabric, smoothness, economy, and adaptation; colors clear and well defined, and in very large variety. Also, for non-fading qualities of colors.

Hope Company, Providence, R. I.

PENTAGRAPH ENGRAVING MACHINE FOR CALICO PRINTERS.

Report.—Commended for novelty in some of the details, and altogether beautifully and accurately made.

Providence Machine Co., Providence, R. I.

SLUBBING, INTERMEDIATE AND FINE COTTON ROVING-FRAME.

Report.—Commended for good workmanship and quality of machines; and for the superior work produced by them.

Hamilton Webbing Co., Wickford, R. I.

WEBBING FOR BOOT AND SHOE STRAPS.

Report.—Commended for excellence, strength, good color, and fitness for service.

Greene & Daniels, Pawtucket, R. I.

SEWING COTTON.

Report.—Commended for economy, adaptability, and good finish of the three-cord sewing cotton.

Putnam Manufacturing Co., Providence, R. I.

COLORED COTTON GOODS.

Report.—Colored curtain hollands a specialty; great variety and

novelty of designs ; colors remarkably good ; blue mottled, new and admirable, fabric excellent.

Lonsdale Co., Lonsdale, R. I.

COLORED SATEENS.

Report. — Commended for remarkably fine quality, beauty of the silk finish, and superiority of coloring ; the cloth being very superior, and the fabric excellent in all respects.

Union Wadding Co., Providence, R. I.

COLORED COTTON WADDING AND BATTING.

Report. — Commended for excellent quality of material ; well prepared, soft and thoroughly glazed ; large variety and evenness ; with general adaptability to use.

S. H. Greene & Son, Clyde Bleachery and Print Works, River Point, R. I.

PRINTED COTTON FABRICS.

Report. — Commended for the excellence of their Washington prints, in imitation oil colors, in ruby and green ; excellent imitation of woven dress goods ; delicate coloring in robes, and steam colors in flags, stripes, and handkerchiefs.

Richmond Manufacturing Co., Providence, R. I.

PRINTED COTTON FABRICS.

Report. — Commended for excellence in pink frockings, garancine pinks, and standard gray styles in calicoes.

Manville Co., Providence, R. I.

FINE BLEACHED COTTON FABRICS.

Report. — Commended for the peculiar excellence of the fine bleached shirtings.

B. B. & R. Knight, Providence, R. I.

COTTON FABRICS.

Report. — Commended for the full line of bleached cottons, excellent in all respects in their several styles.

The J. Y. Smith Manufacturing Co., Providence, R. I.

Report. — Commended for evenness, purity, and good finish.

Slater Cotton Co., Providence, R. I.

COTTON FABRICS.

Report. — Commended for very even quality of their bleached shirtings, known as the “Pride of the West.”

SOUTH CAROLINA.

I. M. Seabrook, S. C.

SEA ISLAND COTTON (RAW).

Report. — Commended for extra length, strength, and fineness of staple.

Wm. Gurney, of Charleston, S. C., for S. A. Beckett, of John Island, S. C.

SEA ISLAND COTTON.

Report. — Commended for unusual fineness, length, strength, and preparation.

ADDENDA.

H. W. Butterworth & Sons, Philadelphia, Pa.

**DRYING MACHINES FOR COTTON FABRICS, AND DYEING MACHINES
FOR COTTON WARPS.**

Report. — Commended as excellent in design, arrangement, and construction, possessing features of novelty and utility, and fitness to the intended purposes.

AWARDS TO FOREIGN EXHIBITORS.

GROUP VIII.

JUDGES.

American.

EDWARD ATKINSON, <i>Secretary</i>	Boston, Mass.
HUGH WADDELL, JR.	Savannah, Ga.
Col. EDWARD RICHARDSON	Jackson, Miss.
A. D. LOCKWOOD	Providence, R. I.
CHARLES H. WOLFF	Cincinnati, Ohio.
Col. SAMUEL WEBBER, C. E.	Manchester, N. H.
GEORGE O. BAKER	Selma, Ala.

Foreign.

ISAAC WATTS, <i>President</i>	Great Britain.
W. W. HULSE, C. E.	"
DON ALVARO DE LA GANDARA	Spain.
Major ARNOLD GOLDY	Switzerland.
Prof. GUSTAV HERRMANN	Germany.
Prof. JOSEPH DASSI	Italy.
MENI RODRIGUES DE VASCONCELLOS	Portugal.

AUSTRALIA.

E. W. Rudder Kempsey, New South Wales, Australia.

FIBRE OF GIGANTIC NETTLE-TREE.

Report. — Fibre of gigantic nettle-tree and bark of sycamore-tree : commended for discovery of fibre and adaptation for trade purposes ; utility ; comparative smoothness.

Thomas Longmire, Kooroocheang, Smeaton, Victoria, Australia.

FLAX STALKS, SEEDS, AND JUTE.

Report. — Very fair specimens, of good quality.

Thomas McPherson & Co., Melbourne, Victoria, Australia.

JUTE.

Report. — Long and soft jute, strong in fibre and of very good quality

Commissioners for Queensland, Australia.**VEGETABLE FIBRES.**

Report. — A large and interesting collection of fibres of vegetable origin, destined to be of great future importance in manufactures.

Botanical Gardens, Melbourne, Victoria, Australia.**FIBRES OF DIFFERENT TREES AND PLANTS.**

Report. — Commended for discovery, adaptation for trade purposes, perseverance in preparation thereof, general utility of following fabrics: flume tree, bottle tree, lantern flower, Chinese grass, cloth plant, free nettle; large assortment of great variety; good-colored jute.

Government of Queensland, Australia.**RAW COTTON.**

Report. — Eight small samples upland cotton, well handled, and fair staple.

J. C. Reed, Gov. of Gaol, Darlinghurst, Sydney, New South Wales, Australia.

MATTING MADE BY THE ABORIGINES.

Report. — Commended for excellence in quality and variety of product.

Royal Commissioners for Victoria, Melbourne, Australia.**VEGETABLE FIBRES.**

Report. — Commended for the very large and valuable collection of vegetable fibres exhibited, destined to be of great importance in the future development of manufacturing industry.

**A U S T R I A.**

Jas. Parma Tichan, Moravia, Austria.

MARSEILLES TUFTED COTTON FABRICS.

Report. — Commended for excellence in material, manufacture of choice patterns, remarkable good work in tufting, great variety of patterns.

Ignaz Richter & Sons, Veidergrund, Bohemia, Austria.

COTTON VELVETS.

Report. — Commended for great variety of distinctly shaded colors,

covering fully one hundred and twenty different colorings, entirely odorless, evenness of fabric, silky finish, durability.

Weissman & Grohmann, Vienna, Austria.

COTTON AND LINEN THREAD.

Report. — Commended for excellence in colors and quality of the threads.

Regenhardt, Raymann, & Kufferle, Vienna, Austria.

LINEN FABRICS.

Report. — Commended for great beauty of design and excellence of execution, in colored bordered damask table linen, as well as superior taste in coloring; also for novelty in linen shawls and scarfs.

Carl Siegel, Vienna, Austria.

LINEN FABRICS.

Report. — Commended for the excellence and adaptability of the sheetings and napkins.

Johann Narboth, Vienna, Austria.

HEMP FIBRES.

Report. — Commended for excellent quality of the undressed rotted and unrotted hemp, and its adaptability for the purpose of cordage.

Agricultural and Forestry Union, at Newstadt, Moravia, Austria.

FLAX AND TOW.

Report. — Dressed flax, of various qualities, in all states of progress from the "hackle" to the "dressed line," prepared after the Belgian method.

A Z O R E S.

The Committee of Port Delgado, St. Michael, Azores.

FLAX AND YARNS OF SAME.

Report. — Commended for excellence of the samples of flax and brown and bleached linen yarns, and also the tow, and yarns of the same.

Juand de Ferreira, Fayal, Azores.

MATS.

Report. — Commended for ingenuity and excellence of the mats and hats, made of fine shavings.

J. L. Dabney, Fayal, Azores.

GRASS AND STRAW GOODS.

Report. — Commended for excellence, economy, and adaptability of fibres and fabrics.

Manuel Machado, Fayal, Azores.

MATTINGS, &c.

Report. — Commended for the excellence, economy, and adaptability of the mattresses and pillow mats, brushes, and other articles made of fine shavings.

BELGIUM.

Canlex Bottelier, Bruges, Belgium.

FLAXES.

Report. — Commended for very good quality and nice variety, specially in strong, soft, and decent long flaxes.

A. Baertsoen & Buyasse, Ghent, Belgium.

DYED VELVETEEN OF COTTON FABRICS.

Report. — Commended for durability and general excellence, richness, and finish, harmony of colors.

Emilie Idreus, Brussels, Belgium.

DYED COTTON YARNS.

Report. — Commended for depth, variety, and delicacy in coloring, with the best quality of materials in all respects.

Joseph Sak Valdens, Tumhart, Province of Antwerp, Belgium.

FLAX TICKING AND AWNING STRIPES.

Report. — Commended for excellence in color and quality of the tickings and awning stripes.

William Wilford, Tamise, East Flanders, Belgium.

LINEN CANVAS AND SAMPLES OF FLAX.

Report. — Commended for the excellence and adaptability of the sail cloth, and the superior evenness of fabric.

Camille Deros & Brother, Conetrai, Belgium.

LINEN AND COTTON PANTALOONERY AND COUTILS.

Report. — Commended for general excellence and adaptability of the linen to cotton pantaloonery, good taste in design, and skill in weaving ; and, also, for excellence in coloring and fabric of coutils.

Jacques de Brands, Alost, Belgium.

LINEN DAMASK AND DIAPERS.

Report. — Commended for the very great beauty in design and superior excellence of fabric and execution of the damask table linens.

Rey Senion, Brussels, Belgium.

LINEN FABRICS.

Report. — Commended for great variety and excellent quality of the articles exhibited, viz. : household linen in all forms, damask loom dies, sheetings, and huckabucks.

Van Damme Brothers, Roulers, East Flanders, Belgium.

LINEN FABRICS.

Report. — Commended for the great excellence and adaptability for clothing for the laboring classes, — of the indigo blue linen ; and also, for the superior excellence of the coloring.

Linens Eliaert of Eliaert-cools, Alost, East Flanders, Belgium.

LINEN YARNS AND SEWING THREAD.

Report. — Commended for general good quality of yarns and threads ; variety of fine colors.

Société de la Lys, Ghent, Belgium.

LINEN AND JUTE YARNS.

Report. — Commended for general excellence in quality of yarn ; great softness and evenness, strength and desirable color of yarns.

Van de Wynckete Brothers & Alsberge, Ghent, Belgium.

BLEACHED YARNS AND THREADS.

Report. — Commended for general good quality of products ; fine white of bleached yarns ; strength of yarns and threads.

Henry Le Clercq, Courtray, Belgium.

FLAX.

Report. — Commended for superior excellence of quality; splendid collection of the flaxes of Belgium; beautiful colors; rare softness of fibre; unsurpassed in the whole exhibition.

Goraert Brothers, Alost, East Flanders, Belgium.

JUTE FABRICS.

Report. — Commended for the economy of fabrication, excellence of quality, and adaptability to purpose of the jute bagging and bags for salt, grain, &c., and also for the evenness of the sail cloth.

B R A Z I L.

Rebello & Co., Brazil.

COARSE COTTON FABRICS.

Report. — Commended for the even spinning, good color, and excellent combination of their striped osnaburgs.

Dr. Martens, Bahia, Brazil.

VEGETABLE FIBRES.

Report. — Commended for the value of the fibres of Urena Latu and Astrocaryum Tucuma, suitable for cordage, fish lines, and hammocks.

Province of Parana, Brazil.

FLAX JUTE.

Report. — Fair quality of flax jute is recommended.

Severine Leite, Brazil.

VEGETABLE HAIR.

Report. — Commended for good quality and great variety of the fibre, in all its processes. Novelties in manufactured goods thereof; variety in specialties.

Province of Bahia, Brazil.

VEGETABLE FIBRES.

Report. — Commended for the value for purposes of cordage, of the fibre of Fourcroya Gigantea.

Provincial Committee of Amazons, Brazil.

VEGETABLE FIBRES FROM TREES.

Report. — Commended for excellence and interest and adaptability for various purposes.

Province of Bahia, Brazil.

VEGETABLE HAIR, JUTE.

Report. — Commended for fair quality of jute, good length and fair color.

Government of Brazil, Rio de Janeiro, Brazil.

RAW COTTON.

Report. — The best display of cotton in quantity and variety from any foreign country.

Dr. Agostinho Emelindo de Leão, Parana, Brazil.

VEGETABLE FIBRES.

Report. — Commended for the value of the fibres of *Bilbergia tinctoria*, for purposes of cordage.

Severino da Costa Seito, Brazil.

VEGETABLE FIBRES.

Report. — Commended for the value and beauty of the fibres of the *Asclepias*; and also, for the four different specimens of "vegetable wool," so called from different species of palm-tree, and the fibre of the *Malpighiosa*.

General Commission of Brazil.

COTTON CLOTHS, HAMMOCKS.

Report. — Commended for the variety of their exhibition, and the adaptability of the articles exhibited to popular wants, including hammocks of different qualities, from different provinces, cotton fabrics, plain, colored quilts, towels, &c.

BRITISH INDIA.

J. Forbes Watson, M. A., LL.D., Director Indian Museum, British India.

VEGETABLE FIBRES.

Report. — Commended for the large and valuable collection of sam-

ples of cotton, flax, rhua, hemp, aloe, musa, and other vegetable fibres, embracing over forty species, of great value, exhibited by the museum, under his care.



CANADA.

Dundas Cotton Mills, Hamilton, Canada.

HEAVY BROWN SHEETINGS AND SEAMLESS BAGS.

Report. — The sheetings are very even and firm, and very clean. The bags are of a very superior quality.

S. L. Fuller, Stratford, Canada.

FLAX.

Report. — Commended for good quality and long staple.



CHINA.

Russell & Co., Canton, China.

MATS.

Report. — Commended for the superior excellence of the straw mattings, of various grades.

Ferguson & Co., Chefoo, China.

STRAW BRAID.

Report. — Commended for the excellence of the straw braids of various qualities.

Imperial Maritime Customs of China.

MATTINGS, GRASS CLOTH, COTTON, COTTON CLOTH.

Report. — Commended for the great variety and excellence of the exhibit, comprising rattan mats, grass cloth in great variety of quality, bamboo, cloth mats from Takon, pine-apple cloth, hemp cloth from Formosa, and mats, woven by the aborigines from the same place; cotton, white and yellow, and cotton cloths, bleached and unbleached, dyed and printed; nankeens, hemp, fine and coarse from various provinces, and hemp cloth, hemp skins (so-called) or fibre of the Bohmeria, China grass, pine-apple fibre and Cori or cocoanut fibre, being a very large, instructive, and valuable collection.

EAST INDIA COLONIES.

Botanical Museum, Buientenzorg, Java, E. I. Colonies.

VEGETABLE FIBRES.

Report. — A large and various collection of fibres of vegetable origin, destined to be of great future importance to manufacturers.

E G Y P T.

National Museum, Egypt.

FLAX AND SILK IMITATIONS, BARKS.

Report. — Commended for good quality and color, and great variety of flax and for fine silk imitations; for great variety of barks.

FIJI ISLANDS.

Ryder Brothers, Mango Islands, Fiji.

SEA ISLAND COTTON.

Report. — It being the best sample of cotton exhibited, and very extraordinary in length of staple, fineness and strength and good handling.

F R A N C E.

Vran & Co., Lille, France.

LINEN THREADS AND TWINES.

Report. — Commended for excellence and variety of the linen threads and twines.

Meunier & Co., France, Paris.

LINEN FABRICS.

Report. — Commended for the exquisite beauty in design and execution, of the damask table linen and the superior quality of the other fabrics.

W. Walcker, Paris, France.

MILITARY AND GARDEN TENTS.

Report. — Commended for the very great variety of military, picnic,

and garden tents, combining excellence of material, with convenience of form and extreme strength, and simplicity of adjustment in a remarkable degree.

Cartier Bresson, Paris, France.

SEWING COTTON.

Report. — Commended for excellence in quality and color, of the sewing cotton exhibited.

C. M. Raffin, Widow & Son, France.

COTTON FABRICS.

Report. — Commended for the excellent quality, both in fabric and color, of the tarlatans and muslins exhibited.

A. Cheffray, Maroure, near Rouen, France.

FURNITURE HANGINGS.

Report. — Commended for the beauty of design, excellence of combination of colors, and adaptability to purpose, of the cotton and linen hangings and curtains.

Hapebruck Brothers, Comines, France.

LINEN THREADS.

Report. — Commended for the excellence in quality, variety in color, and the very neat manner of putting up for use of the linen sewing threads.

Khediye of Egypt.

Report. — About 4,000 samples of raw cotton taken from sales in the last four years. A large and varied exhibit of Egyptian cotton samples, of excellent staple.

GERMANY.

S. Meyer & Co., Bielefeld, Germany.

LINEN FABRICS.

Report. — Commended for great excellence and variety in the collection of linen shirt fronts, collars, and cuffs, and for adaptability and economy of fabrics.

Steam-Netting Factory and Weaving Mills, Itzehoe, Holstein, Germany.

NETS AND SAIL CLOTH.

Report. — Commended for very good quality of cotton and linen

nets; first-rate workmanship; goods made of the best yarn with great care.

Rolffs & Co., Siegfeld, Germany.

PRINTED COTTON HANDKERCHIEFS.

Report. — Commended for great variety and good execution, taste in design, and brilliancy in colors, as well as for novelties in style in printed handkerchiefs.

Schlicper Baum, Elberfeld, Germany.

PRINTED COTTON FABRICS.

Report. — Commended for great variety and beauty in design, very superior excellence in colors and execution not only in madder styles, but in a great variety of combination with aniline, artificial alzorine, ultramarine blue, and straw colors.

Weigert & Co., Berlin, Germany.

COTTON, CHENILLE, SHAWLS, & C.

Report. — Commended for novelty of fabric, excellent quality of this especial specimen of cotton goods, beauty of coloring, and economy of cost.

H. Lowenberg, Charlottenberg, near Berlin, Germany.

IMITATION OF LEATHER RELIEF ORNAMENTS FOR HATS, BOOTS, AND SHOES.

Report. — Commended for novelty of material, variety of objects and fitness to the purpose intended.

Mechanical Cotton-Velvet Weaving Co., Hanover, Germany.

COTTON VELVETS AND VELVETEENS.

Report. — One of the most artistic exhibits in the Exposition, blending of colors excellent, texture and finish superb, elegant, durable, exquisitely tasteful. The colors and fabric blend so harmoniously and are so exceedingly well done as to give the appearance and finish of silk velvet. The new black, in various shades, is full of light and lustre, a complete triumph, in both finish and color.

A. Gross & Co., Brucksol, Baden, Germany.

COLORED COTTON VELVETS.

Report. — These goods are low priced, and for the lower grades, exhibit good workmanship and remarkable variety in bright colors.

Karl Kauffmann, Bentlinger, Wirtemberg, Germany.

COLORED-WOVEN QUILTS.

Report. — Commended for excellence in design, weaving, colors, economy.

Collective Exhibit of Wirtemberg Linen Manufacturers, Germany.

LINEN FABRICS.

Report. — Commended for the great variety and general excellence of the fabrics.

Collective Exhibit from the Gladbach District, Germany.

COTTON AND MIXED GOODS.

Report. — Commended for great variety of fabrics; excellence of design; well made throughout, durable, economical, and altogether a thoroughly well assorted exhibit.

GREAT BRITAIN.

J. B. Brown & Co., London, England.

GALVANIZED WIRE NETTING FOR ENCLOSING POULTRY, PHEASANTS, DOGS, &c.

Report. — Commended for excellence in assortment from four inches to one-half inch size of meshes, material, workmanship, economy, regularity of meshes, for quality, and manner of galvanizing.

N. Greening & Sons, Warrington, England.

WOVEN WIRE.

Report. — Commended for excellence in material, regularity of meshes, smoothness of wire, strength of fabric, very wide in heavy wire, woven fabrics, general purposes, for malt kilns, rice and flour mills; general mining purposes.

Cox Brothers, Dundee, Scotland.

JUTE CORDS.

Report. — Dressed cords, jute yarn, carpet twist, and dyed twist; commended for superior evenness and smoothness, and excellent color in the dyed goods.

Barnard, Bishop, & Barnard, Norfolk, Great Britain.

WIRE FENCING.

Report. — Excellence in diagonal weaving of a low price fabric.
Principal merit, economy and adaptation to general use.

Neilson, Stover, & Sons, Johnstone, near Paisley, Scotland.

KNITTING AND EMBROIDERY COTTON YARN.

Report. — Commended for the peculiar softness, flexibility, evenness, fitness for their intended purposes.

Barlow & Jones, Manchester, England.

VESTINGS, MARSEILLES QUILTS, COSTUMES, &c.

Report. — Commended for the general excellence and variety of the goods exhibited, and for the special beauty and quality of the Marseilles quilts, which appear to us to be unequalled in style and quality.

John Hawkins & Sons, Manchester, England.

BLEACHED SHIRTINGS.

Report. — Commended for the special fineness, even texture, and excellent bleach of their highest grades of goods, combined with softness and purity.

Jabez Johnson & Fields, Manchester, England.

COLORÉD QUILTS, MARSEILLES VESTINGS, TURKISH TOWELS.

Report. — Commended for excellence in coloring, exceedingly well defined, good designs, Marseilles vestings, thoroughly well woven and colored, fine material, Turkish towels and towelling, excellent in every way. In all respects, these three varieties are very superior.

Simpson & King, Manchester, England.

PRINTED COTTON FABRICS.

Report. — Commended for very superior excellence in design and combination of colors in cotton fabrics, for household decoration, printed in imitation of needle work, as shown by the Kensington School of Design. Remarkable and novel in all respects.

Salis, Schnobe & Co., Manchester, England.

PRINTED COTTON FABRICS.

Report. — Commended for variety and elegance in design, coloring,

and engraving, in printed cotton fabrics for dresses and furniture chintzes and madder colors, of great excellence and beauty.

J. & P. Coats, Paisley, Great Britain.

SEWING COTTON.

Report. — Commended for superior strength, and excellent quality of spool cotton.

Marshall & Co., Leeds, England.

LINEN SEWING THREADS AND OTHERS.

Report. — Commended for superior excellence in quality and color of threads, specialties and general variety of goods, splendid collection of goods in every respect.

Ferguson Brothers, Holmehead Works, near Carlisle, Great Britain.

DYED SILESIA SATEENS.

Report. — Commended for fineness of texture, superior colors, superb dyeing, with a finish of remarkable excellence, the harmony and blending of colors is exceedingly fine, also, in great variety.

Fairbaine, Kennedy & Naylor, Leeds, England.

MACHINERY FOR PREPARING AND SPINNING JUTE, &c.

Report. — Commended for excellence in design, arrangement, and construction of the machines, and for the quality and economy of their productions.

Saml. Lawson & Sons, Hope Foundry, Leeds, England.

MACHINERY FOR CORDING, PREPARING, AND SPINNING JUTE, &c.

Report. — Commended for excellence in design, arrangement and construction and smoothness in working of the machines, resulting in superior and economical production.

Howard & Ballough, Accrington, England.

CARDING ENGINE, DRAWING FRAME (INTERMEDIATE RING FRAME).

Report. — Commended for the very great novelty and originality of the electric stop-motion, which overcomes one of the most serious difficulties incident to the intermediate roving frame, and is also of great value as applied to the card and drawing frame, and for good workmanship and excellence of machines.

Thomas Gadd, Manchester, England.

**EIGHT-COLOR CALICO PRINTING MACHINE AND STEAM ENGINE;
ALSO, ROLLER ENGRAVING MACHINERY.**

Report. — Commended for great excellence in design, arrangement and construction; fitness for the purpose intended; economy and adaptation to public wants.

Platt Bros. & Co., Oldham, England.

LONG STAPLE COTTON GIN.

Report. — Commended for originality of invention, perfection in construction, and adaptation to public wants in ginning of long staple cotton or "sea island cotton." It ginned in presence of the judges, in thirty minutes, $247\frac{1}{2}$ pounds of sea island long-staple seed cotton (or equal to the capacity of about a twenty-five-saw gin on short staple cotton), without injury to the lint, requiring about one-half the power of the saw gin, the work being perfectly done.

Thomas Hall, Edinburgh, Scotland.

**HAND PAINTED CLOTHS, IN IMITATION OF TAPESTRY, FOR WALL
DECORATION.**

Report. — The novel application of scene decorations for domestic purposes, carried out by two very effective landscape paintings, size 9×6 feet, painted in water-colors, on jute canvas, adapted for inside walls and panels.

Bowlinikon Floor Cloth Manufacturing Co., Manchester, England.

FLOOR CLOTH.

Report. — Commended for originality in material, adaptation to public wants and fitness to the purposes intended, besides good quality, first designs, flexibility, and apparently great durability, moderate prices.

Michael Nain & Co., Kirkcaldy, Great Britain.

FLOOR OIL CLOTHS.

Report. — Commended for excellent workmanship and material, for tasteful designs and beautiful colors, extraordinary and unequalled size; for flexibility and superior quality.

Wm. Laird & Co., Cassimere Linen Works, Forfur, Scotland.

LINEN FABRICS AND JUTE GOODS.

Report. — Commended for general excellence and utility, and great

variety of fabrics, in damask loom, dies, sheetings, ducks, towelling, osnaburgs, buckram, paddings, stair coverings, seamless bags, hessians, horse-cloths.

Robert McBride & Co., Belfast, Ireland.

COTTON AND MIXED COTTON AND LINEN GOODS.

Report. — Commended for neatness of design, and clearness of printing on linen lawns; superior fineness and excellence of Swiss mulls, and other cotton fabrics.

York-Street Spinning Co., Belfast, Ireland.

LINEN FABRICS.

Report. — Commended for excellence of linen sheetings and printing linens; novelty in linen brocades, skill in printed linens, and general variety and excellence of fabrics.

Henry Matier & Co., Belfast, Ireland.

LINEN FABRICS.

Report. — Commended for excellence and fineness of fabric, beauty of design, and embroidery in linen handkerchiefs, cuffs, and collars; and also, on printed linen handkerchiefs, for excellence in design and printing.

John S. Brown & Sons, Belfast, Ireland.

LINEN FABRICS.

Report. — Commended for superior excellence and beauty in design and execution in damask table linen; extraordinary fineness in diapers, handkerchiefs, and yarn, and great excellence in linen frontings and sheetings, and for general perfection of fabrics.

Fenton, Connor, & Co., Linen Hall, Belfast, Ireland.

LINEN FABRICS.

Report. — Commended for excellence and variety of exhibit and superior quality of fronting linens, linen dress goods and printed lawns.

J. N. Richardson, Sons, & Owden, Belfast, Ireland.

LINEN FABRICS.

Report. — Commended for excellence and beauty in design and execution, in damask table linen; superior fineness and quality of linen frontings and handkerchiefs.

Dicksons, Fergusson, & Co., Belfast, Ireland.

LINEN FABRICS.

Report. — Commended for superior quality of huckabucks and handkerchiefs, and general excellence and variety of articles.

Greenmount Flag Spinning Co., Dublin, Ireland.

LINEN FABRICS.

Report. — Commended for great variety and excellent quality and adaptability to purpose of brown and striped linen drills, awning stripes, sheetings, diapers, stair drills, towels, towelling, and horse-covers.

Dunbar, McMaster, & Co., Gilford, Ireland.

LINEN THREADS, GRAY, BLEACHED, AND DYED.

Report. — Commended for superior excellence in quality and colors; general variety of products; novelty and speciality in flosses; splendid collection of goods in every respect.

Ultathorne & Co., Durham, England.

SHOE THREADS.

Report. — Commended for superior quality and evenness of yarns; great variety and brilliancy of colors; great utility of the articles manufactured.

Frank S. Sandeman, Manhattan Works, Dundee, Scotland.

LINEN AND JUTE YARNS, CANVAS PADDINGS, &c.

Report. — Commended for general good quality in yarns and canvas; novelty in imitation of human hair and pads.

John Clark, Jr. & Co., Glasgow, Scotland.

SEWING COTTON.

Report. — Commended for excellence in color, quality, and finish of the six-cord sewing cotton.

Jonas Brook & Brother, Melthorn Mills, Huddersfield, England.

SEWING COTTON.

Report. — Commended for variety and general excellence of product, in crochet, embroidering, and sewing cotton.

John Dewhurst & Sons, Belle Vue Mills, Skipton, Yorkshire, England.

SEWING COTTONS.

Report. — Commended for economy, adaptability, and excellent finish of the glaze three-cord sewing cotton.

T. & D. Wilson, Glasgow, Scotland.

COTTON FABRICS.

Report. — Commended for the great variety and excellent quality of the cotton fabrics, notably the Swiss mulls, Victoria lawns, and other goods of that class, as well as for the beauty and excellence of the curtain stuffs.

HOLLAND.

Dutch Agricultural Society, Rotterdam, Holland.

FLAX HEMP.

Report. — Commended for excellence in quality, and adaptability to purpose, of the dressed flax and hemp.

A. F. Van Casteel, Rotterdam, Holland.

DRESSED FLAX.

Report. — Commended for the great length and excellent quality of fibre of the Dutch, Zealand, and Friesland dressed flax.

Zealand Association for the Promotion of Agriculture, Holland.

DRESSED FLAX AND HEMP.

Report. — Commended for the great excellence of the specimens of dressed hemp and flax.

Dutch Association for Encouragement of Industry, Rotterdam, Holland.

FLAX LINSEED.

Report. — Commended for first-rate quality of fibre; strength and vigor of fibre; fine dark color; softness and general beauty of material.

ITALY.

Gorgeonic Brothers, Turin, Italy.

COTTON QUILTS AND BLANKETS.

Report. — Commended for even quality in the weaving, and for excellent taste in the designing.

Vicshietti Cesare, Florence, Italy.

YINESTRO GRASSES.

Report. — Commended for remarkable flexibility; well adapted to the various uses to which such grasses can be put.

Polidoric Count Augusto Nyhiasi, Bologna, Italy.

GRASSES, PREPARED, GINESTRO.

Report. — Commended as well prepared, in all respects, for commercial purposes; fineness and tenacity of fibre; well adapted to the manufacture of grass goods.

Bass, Abarote & Co., Turin, Italy.

COTTON COUNTERPANES AND BLANKETS.

Report. — Commended for excellence in design and fabrics, and adaptability to purpose.

Remaggi Brothers, Naracchio, Pisa, Italy.

LINEN FABRICS.

Report. — Commended for excellence and adaptability to purpose, of damasks and pantalooning.

Pietro F. Fachini & Co., Bologna, Italy.

HEMP AND FLAX.

Report. — Commended for superior excellence in raw, scutched, and combed flaxes and hems; great strength and length of products; fine lines and clear, soft tows; clearness of color and brightness of white and yellow unsurpassed. Splendid specimens of the product of Italy.

L. Kluftinger, Bologna, Italy.

HEMP.

Report. — Commended for very great variety and excellence of the collection of dressed hemp fibre, of extraordinary fineness.

Alessio Brothers, Milan, Italy.

COLORED COTTON YARNS.

Report. — Commended for evenness and excellence in color, and smoothness of thread in the turkey-red cotton yarns.

Bernardo Meda, Monza, Milan, Italy.

COLORED COTTON YARNS.

Report. — Commended for the excellence in color of the Turkey-red yarns.

Paola Vincenze, Capi Modena, Italy.

WOVEN BRAIDS AND TRIMMINGS OF WOOD.

Report. — Commended for the ingenuity and evenness of fibre of the woven braids and trimmings made of wood fibres, representing an important branch of industry.

J. V. Gentiluomi & Co., Pisa, Italy.

COLORED COTTON FABRICS.

Report. — Commended for excellence and adaptability in fabric, design, color, and variety of colored cotton fabrics.

John Fornara & Co., Turin, Italy.

WIRE CLOTH.

Report. — Commended for the great variety and general excellence of the samples of wire cloth; ranging from very coarse, for fencing purposes, to fine wire gauze.

JAMAICA.

Robert Thompson, Superintendent Botanical Gardens, Kingston, Jamaica.

SISAL HEMP, CHINA GRASS, ETC.

Report. — Commended for great utility of all these fibres in the collection, especially Sisal hemp, China grass, pine-apple, bamboo, lace-bark, especially adapted for ornamental purposes; of novelties, and good quality. Utility of bamboo, for paper manufacturing, especially noted. Rob. Nimes, Mrs. G. Brook, works of lace bark.

Gordon Town, Jamaica.

Robert Thompson, Superintendent Government Botanical Gardens.

VEGETABLE FIBRES.

Report. — Commended for the large and important collection of vegetable fibres, destined to be of great importance to manufacturers.

JAPAN.

T. Asaya, Tokio, Japan.

VEGETABLE FIBRES.

Report. — Commended for the value of the collection of vegetable fibres; viz., hemp, ramie, jute, &c.

Association of Women, Kiyoto, Japan.

COTTON RUGS, — DANTSUORI.

Report. — Commended for the peculiar method of working cotton into a useful rug, of peculiarly attractive style.

Imperial Board of Agriculture, Commerce and Industry, Tokio, Japan.

COTTON RUGS.

Report. — Commended for the utility and adaptability to purpose, of the collection of plain and colored mattings.

Municipality of Osaka, Japan.

COTTON RUGS.

Report. — Commended for the utility, and adaptability to intended purpose, of the articles exhibited.

Local Government of Nara-ken, Japan.

BLEACHED HEMP CLOTH.

Report. — Commended for the fineness of the fabric produced from hemp, and its adaptability to the purposes of clothing for which it is intended.

Local Government of Ni-i-gata-ken, Japan.

RAMIE CLOTH.

Report. — Commended for the variety and adaptability of the ramie fabrics, as well as the ingenuity shown in the use of printed or dyed yarns; producing figures, when the cloth is woven.

Local Government Loo Choo Islands, Japan.

FABRICS OF COTTON, HEMP AND PLANTAIN FIBRE.

Report. — Commended for the variety of articles exhibited, showing

the ordinary fabrics of the country ; and the adaptability of the hemp and plantain cloths for use in hot climates.

Government of the Loo Choo Islands, Japan.

VEGETABLE FIBRES.

Report. — Commended for the value of the collection of vegetable fibres and China grass.

Government Cotton Factory, Sakai, Japan.

COTTON, COTTON FABRICS.

Report. — Commended for the completeness and excellence of the exhibit of cotton, raw and in various states of progress of manufacture.

—o-o-o-o—
MAURITIUS.

—◆—
I. Horne, Director Botanic Garden, Mauritius.

VEGETABLE FIBRES.

Report. — A large and valuable collection of vegetable fibres, destined to be of great future value, as subjects of manufacture.

—o-o-o-o—
MEXICO.

—◆—
Government of the State of Hidalgo, Mexico.

VEGETABLE FIBRES AND FABRICS.

Report. — An admirable collection of fibres and textile fabrics, of the "Agave Americana," coarse, fine, and colored, with a representation of the plant in wax.

Government of the State of Yucatan, Mexico.

VEGETABLE FIBRES AND FABRICS.

Report. — Commended for the very fine collection of hammocks, mats, and bagging and small cordage made of the fibres of the Maguey plant, or Agave, with the exhibit of fibres of the same, of great length and strength.

NETHERLANDS.

Hilvensumsche, Steam Spinning and Weaving Manufactory, Amsterdam, Netherlands.

COTTON FABRICS.

Report. — Commended for honest, strong, durable, and well made quilts and sheetings.

C. T. Stork & Co., Wingelon, Netherlands.

MADRAS GINGHAMS AND MADRAS HANDKERCHIEFS.

Report. — Commended as especially well made for general use, good material throughout in fabric and coloring matter, economically made and will be economical in service.

W. Swinkels, Helmond, Netherlands.

DYED COTTON YARNS.

Report. — A very fine assortment of high colors, the dyeing of wonderful brilliancy and evident durability.

I. H. Ferhorst, Lyssen, Netherlands.

JUTE AND FLAX GOODS.

Report. — Commended for general excellence, good quality, and strength, of burlaps and bags.

Van den Menwenhuzzen and Van Stratum, Geldrap, Netherlands.

LINEN FABRICS.

Report. — Commended for excellence and adaptability to purpose in loom dyes and huckabuck.

NEW ZEALAND.

Charles Chinnery, Addington, Canterbury, New Zealand.

PHORMIUM FIBRE.

Report. — Commended for excellent quality of fibre for roping purposes ; great strength, careful preparation thereof.

Commissioners of Centennial Exhibition of New Zealand.

PHORMIUM.

Report. — A general collection of fibre, illustrating all manners of

preparation and applications for the manufacture of rope, cordage, yarn, cloth, and paper. Commended for great labor and pains, and for economy and quality of the different products.

Dr. James Hector, Commissioner, Wellington, New Zealand.

VEGETABLE FIBRES AND FABRICS.

Report. — Commended for the large and valuable collection of fibres of vegetable origin, with samples of the fabrics produced therefrom, especially of the “Phormium tenax,” or New Zealand flax, indicating the direction of a new and important industry.

N O R W A Y .

Nydalens Company, Christiana, Norway.

COTTON FABRICS.

Report. — A large and excellent display of plain and colored fabrics.

Christiana Sail Cloth Co., Christiana, Norway.

SAIL CLOTH, YARNS, AND TWINES.

Report. — Commended for excellence and adaptability to purpose.

P E T R E A .

Hassan Ali, Yemen, Arabia Petrea.

COTTON FABRICS.

Report. — Commended for the excellence in fabric and color, and adaptability to purpose, of the striped tent curtains.

P H I L I P P I N E I S L A N D S .

Donna Segunda Hores, Philippine Islands.

MANUFACTURE OF FIBRES.

Report. — Commended for the great beauty and exquisite delicacy of the silk and “pine-apple-fibre” dresses and handkerchiefs.

Don Placido Yuson, Philippine Islands.

MANUFACTURES OF VEGETABLE FIBRES.

Report. — Commended for fineness and beauty of the fabric of “Yusi” and silk.

Provincial Government of Albay, Philippine Islands.

MANILLA HEMP.

Report. — Commended for the great excellence of the Manilla hemp, in strength and evenness of fibre.

Provincial Government of the Camarines, Philippine Islands.

MANILLA HEMP FIBRE.

Report. — Commended for great excellence in length, strength, and uniformity of fibre.

Provincial Government of Lagunos, Philippine Islands.

MANILLA HEMP.

Report. — Commended for excellent quality, in length, strength, and evenness of fibre.

Don Jose Feced, Manilla, Philippine Islands.

CLOTH FROM THE MANILLA HEMP.

Report. — Commended for the fineness and delicacy of the cloth made from the fibre of the “Musa textilis” or Manilla hemp.

Munoz Brothers, Albay, Philippine Islands.

VEGETABLE FIBRES.

Report. — Commended for the excellence in quality of the fibres of the Manilla hemp, and “Cabo negro” palm.

Don Tomas Gallegos, Province of Batangas, Philippine Islands.

BANANA FIBRE.

Report. — Commended for the beauty and adaptability to manufacture of the banana fibre.

Dr. Edward Ordimas, Batangas, Philippine Islands.

VEGETABLE FIBRES.

Report. — A large collection of valuable fibres from “Musa textilis,” and other plants.

Provincial Government of the Camarines (North), Philippine Islands.**VEGETABLE FIBRES.**

Report. — Commended for the excellence in length and strength of the fibres of the collection of Manilla hemp, "*Musa textilis*."

Provincial Government of the Camarines (South), Philippine Islands.**VEGETABLE FIBRES.**

Report. — Commended for the excellent quality in length and strength of the fibres of Manilla hemp, "*Musa textilis*."

Jose Rodriguez Vigan, Yloco Sur, Philippine Islands.**VEGETABLE FIBRES.**

Report. — Commended for the value of the fibre of the "*Agave vivipara*."

Fr. Nicolas Zugadi, Balaca, Isle de Lyön, Philippine Islands.**VEGETABLE FIBRE.**

Report. — Commended for the excellence and adaptability for hats and mats, of the fibres of the sygodium or climbing fern, called "*Nito Limpio*."

Provincial Board, Antigua, Philippine Islands.**FABRICS OF VEGETABLE FIBRE.**

Report. — Commended for the great variety of fabrics of pine-apple and other fibres, of great beauty and delicacy, collected and exhibited by them, as well as for the collection of the fibres themselves.

Provincial Board of Batangas, Philippine Islands.**FABRICS OF VEGETABLE FIBRE.**

Report. — Commended for the great variety of fabrics of pine-apple, and other fibres, of great beauty and delicacy, collected and exhibited by them, as well as for the collection of the fibres themselves.

Tiburcio Villamarzo, Tayabas, Philippine Islands.**VEGETABLE HAIR FIBRE.**

Report. — Commended as well adapted for submarine purposes; impervious to water rot; very flexible; adapted to weaving and rope-making.

Dona Proasa Dimayuga, Province of Batangas, Philippine Islands.

COTTON.

Report. — Commended for the good quality of the cotton, being the best shown from the East Indies; and the evenness of the yarn spun from the same.

Provincial Government of Batangas, Philippine Islands.

COTTON.

Report. — Commended for the excellence of the samples of cotton, and the yarns spun from the same.

Dona Juana Reyes, Province of Batangas, Philippine Islands.

COTTON YARNS.

Report. — Commended for the excellence and adaptability of the cotton yarns.

Don Eduardo Ordnuu, Province of Batangas, Philippine Islands.

COTTON.

Report. — Commended for the good quality of the cotton.



PORTUGAL.

Manuel Alvarez Montez, Oporto, Portugal.

COTTON FABRICS.

Report. — Commended for variety, durability, and excellence of cotton fabrics.

Cotton Manufacturing Co., Xabagas, Portugal.

COTTON FABRICS.

Report. — Commended for excellence in colored cambrics and bleached and brown cotton yarns.

Lisbon Spinning and Weaving Co., Lisbon, Portugal.

COTTON FABRICS.

Report. — Commended for great variety, general excellence, and adaptability to the wants of the people.

Cotton Spinning Mill, Balsa, Portugal.**COTTON FABRICS.**

Report. — Commended for the general good quality of the fabrics.

Royal Spinning Co., Thomar, Portugal.**COTTON YARNS.**

Report. — Brown, bleached, and dyed cotton yarns, of good quality and of reasonable price.

Crestuma Spinning Co., Crestuma, Portugal.**COTTON YARNS.**

Report. — Even, smooth, good spinning thread.

Anjos Cunha Ferriera, Lisbon, Portugal.**COTTON FABRICS.**

Report. — Commended for very excellent display and variety of colored cotton goods, suitable to the laboring classes, especially their cotton handkerchiefs.

Augusta Frederica, Estor, Portugal.**COTTON FABRICS.**

Report. — Commended for economy and adaptability to purpose, in their cotton handkerchiefs and prints.

Fabricades Estamperas de Balbao, Balbao, Portugal.**PRINTED COTTON.**

Report. — Commended for general adaptability to purpose at a reasonable price, of the indigo blue fabrics.

Company of Estampera, Portugal.**PRINTED COTTON FABRICS.**

Report. — A large and well-executed assortment of printed calicoes and furniture chintzes.

Arojos & Company, Portugal.**DYED COTTON FABRICS.**

Report. — Commended for general excellence of indigo blue dyed cotton fabrics, with peculiar adaptability to the wants of the masses.

Antonio de Casta, Guimaraens, Portugal.

LINEN FABRICS.

Report. — Commended for excellent quality of bed and table linen and embroideries.

Manuel Mandes Ribeiro, Guimaraens, Portugal.

LINEN DAMASK.

Report. — Commended for good serviceable quality of table linen, and very reasonable prices.

Jose Carneiro de Mello, Oporto, Portugal.

COTTON AND LINEN FABRICS.

Report. — A large display of cottonades, cotton blankets, cotton yarn and linen drill, of good quality and durability.

Rodrigo Antonio Lisbon, Portugal.

COTTON AND LINEN FABRICS.

Report. — A large and substantial variety of cottonades, cotton blankets, shawls, vestings, gingham, and brown linens.

Fabrica Torres, Nones, Portugal.

LINEN FABRICS.

Report. — Commended for good qualities of linen duck drills and fancy pantaloony.

Bahia & Graro, Lisbon, Portugal.

COTTON AND LINEN FABRICS.

Report. — Commended for colored domestic vestings and excellent brown linen drills.

Anacleto de Fonseca Matta, Sardoal, Santarem, Portugal.

HEMP.

Report. — Commended for excellence in length and fineness.

Jose de Sequeira Pinto Quirevoz, Vianna do Castello, Portugal.

FLAX.

Report. — Commended for the excellence of staple.

Fernandes Manuel Ignacia, Portugal.

FLAX FIBRES.

Report. — Commended for the fineness and softness of staple.

J. Aug. du Silveira, Penafiel, Porto, Portugal.

FLAX.

Report. — Commended for excellence in length and softness of the flax fibre.

Pedro Martino Viera, Braga, Portugal.

FLAX.

Report. — Commended for excellence in quality of sample of flax.

A. B. Whiskow, Volgoda, Russia.

FLAX FIBRES.

Report. — Commended for the large collection, and excellent quality of the specimens of flax, grown in the extreme north of Russia.

Victorina da Costa Soverat, Mondim de Basto, Portugal.

FLAX.

Report. — Commended for fineness and softness of the flax samples.

Manuel Deas de Silva, Oporto, Portugal.

MATTINGS.

Report. — Commended for excellence, economy, and adaptability.

Manuel d'Oliveira, Oporto, Portugal.

FABRICS OF VEGETABLE MATERIALS.

Report. — Commended for excellence and ingenuity of the mats, flask covers, and other articles made of rushes.

Bruno da Silva, Lisbon, Portugal.

MATTINGS.

Report. — Commended for adaptability and excellence of quality.

Portuguese Government, Portugal.

VEGETABLE FIBRES.

Report. — A large and varied assortment of fibres of vegetable origin, from Portugal and her colonial possessions.

Colonial Government of Mozambique, Portuguese Colonies.

VEGETABLE FIBRES.

Report. — Commended for the valuable collection of fibres of great

industrial promise, and the baskets, mats, and other fabrics produced from the same.

Colonial Government of Macon and Fimor, Portuguese Colonies.

VEGETABLE FIBRES.

Report. — A valuable collection of fibres of great industrial promise, and of mats, and other fabrics produced from the same.

Joaquin de'l Oliveria, Melindre, Oporto, Portugal.

MATTINGS.

Report. — Commended for the design and execution of the colored rush mattings.

Colonial Government of Angola, Portuguese Colonies.

VEGETABLE FIBRES.

Report. — A valuable collection of fibres of great industrial promise, also articles of native workmanship produced from the same.

Colonial Government of Cape Verde, Portuguese Colonies.

VEGETABLE FIBRES AND FABRICS.

Report. — A valuable collection of fibres of great industrial promise, and also of mats, and baskets, produced from the same.

Colonial Government of Portuguese India, Portuguese Colonies.

VEGETABLE FIBRES.

Report. — A valuable collection of fibres, of great industrial promise, and also the fabrics produced from the same.

W. H. Dabney, Azore Isles, Portuguese Colonies.

FLAX FIBRE.

Report. — Commended for the good quality of the specimens of dressed and half-dressed flax, showing the resources of the islands.

Almeida & Silva, Oporto, Portugal.

MATTINGS.

Report. — Commended for adaptability and economy of the rush matting exhibited.

Portuguese Colonies.**RAW COTTON.**

Report. — Although the samples shown are too small to receive an award as an actual commercial exhibit by individuals, they are deserving of one as an exhibit of the capabilities of the districts wherein they were grown, and the enterprise of the government which has collected them, as well as for the promise which they offer for the future.

Commission of Angola, Portugal (Colony Angola).**WOODED FIBRE.**

Report. — Commended as well prepared ; very fibrous, strong, flexible ; adapted to many manufacturing purposes.

Jonquim Rodriguez, Portugal.**FLAX.**

Report. — Commended for excellence in length and strength of the combed flax.

National Rope Yard, Lisbon, Portugal.**CANVAS.**

Report. — Commended for the fair and serviceable quality of canvas, well suited to use.

RUSSIA.**N. Garelin & Sons, Ivanovo-Vosnesensk, Wladimir, Russia.****PLAIN AND PRINTED COTTON FABRICS.**

Report. — An admirable exhibition of cotton in all forms, from the staple as grown in the Caucasus, through all the various processes of manufacture into remarkably level yarns, smooth and firm cloth, and dyed and printed fabrics, of great excellence in color, design, and execution.

John Koushin, Serpvokhov, Moscow, Russia.**COTTON FABRICS.**

Report. — Commended for especial excellence in the exhibit of cotton in every state of progress, from the bale to cloth of great evenness, fineness, and beauty.

John Garelin, Ivanovo-Vosnesensk, Wladimir, Russia.

COTTON FABRICS.

Report. — Commended for economy in cost, and adaptability to popular wants, of the plain and printed cottons.

Alexis Possylin, Ivanovo-Vosnesensk, Wladimir, Russia.

PRINTED COTTON FABRICS.

Report. — Commended for the excellence in design, colors and printing, as well as the economy of production of the printed cotton handkerchiefs, for the use of the peasants.

Paul Lopatin, Ivanovo-Vosnesensk, Wladimir, Russia.

PRINTED COTTONS.

Report. — Commended for excellence in design and execution of printed calicoes, in light colors and combinations; and also beauty of design and skill in coloring, of furniture prints.

Catherine Koovajef, Dimir, Russia.

PRINTED COTTONS.

Report. — Commended for excellence in madder pink "frock plates."

I. Pal, St. Petersburg, Russia.

DYED AND PRINTED COTTON FABRICS.

Report. — Commended for excellence in design, combination and colorings, in light chintz cambrics, furniture prints and handkerchiefs; and also in dyed plain cambrics and cotton pantaloony.

Stephen Borisso & Son, Ivanovo-Vosnesensk, Wladimir, Russia.

PRINTED COTTON FABRICS.

Report. — Commended for great excellence in design and combination in colors, and neatness of execution in chintz furniture and calicoes.

Nicholas Polooshin, Ivanovo-Vosnesensk, Wladimir, Russia.

PRINTED COTTON FABRICS.

Report. — Commended for superior excellence in coloring, and neatness of design and execution, in madder and steam colors, in cambrics and fancy woven cotton goods.

W. Menshikoff & Sons, Ivanova-Vosnesensk, Wladimir, Russia.

PRINTED COTTON FABRICS.

Report. — Commended for economy and adaptability of printed cotton fabrics, for popular use.

Hille & Dietrich, Giradov, Warsaw, Russia.

LINEN FABRICS.

Report. — Commended for very great general excellence and variety of the linen fabrics, comprising duck; bed and table linen, bleached; also, colored damasks, of great beauty in design and combinations of colors; fringed and colored duck table-cloths; bath towels, brown and bleached, and frontings.

Lange & Co., Moscow, Russia.

FLAX FABRICS.

Report. — Commended for the superior quality of the samples of linen fire-hose and twines.

Alexandrof & Alafoozof, Kazan, Russia.

LINEN FABRICS.

Report. — Commended for the superior fineness and evenness of the flax, tow yarns, and cloths, and their economy and adaptability to popular use.

C. Zinserling, St. Petersburg, Russia.

COTTON AND LINEN FABRICS.

Report. — Commended for excellence, variety, economy, and adaptability to purpose of the braids, webbing and tapes.

James Gribanof & Sons, Volgoda, Russia.

LINEN FABRICS.

Report. — Commended for the high excellence of quality of the linen yarns, cloths, handkerchiefs, front linens and damasks.

Baron A. Stieglitz, Harva, Russia.

CANVAS.

Report. — Commended for excellence in all respects, of the sail-duck, of various grades of fineness.

Gendt & Co., Russia.

FLAX.

Report. — Commended for the great strength and fineness of the flax.

Statistical Committee of Pskov, Russia.

FLAX FIBRE.

Report. — Commended for the very large and admirable collection of the fibres of flax, raised on very poor and sandy soil; and showing all the steps of preparation, previous to spinning, which they exhibit; all of very superior quality.

Prince Reprine, Gov't of Pultowa, Russia.

FLAX FIBRES.

Report. — Commended for very valuable and instructive collection of flax fibres, in different states of progress.

Theodore Bykof, Vologda, Russia.

FLAX PRODUCTS.

Report. — Commended for the great length and smoothness of fibre, and strength and excellence of the flax yarns.

Zimin Bros., Gov't of Moscow, Russia.

COTTON FABRICS.

Report. — Commended for excellence in quality, and economy in price, of dyed Turkey-red cottons, used by the common people.

Eugene Karamyshef, Torjok, Tver, Russia.

HEMP AND FLAX.

Report. — Commended for economy and adaptability of the flax and hemp fibres produced from ripe plants, with specimens of the plants in seed.

Anthony Nemilof Rjef, Tver, Oral, Russia.

HEMP.

Report. — Commended for the excellence in length and strength, of the dressed hemp.

Board of Exchange of Riga, Russia.

FLAX AND HEMP.

Report. — Commended for the admirable selection of the specimens of flax and hemp, in different states of progress.

C. Nemiloff, Prov. Aval, Russia.

HEMP.

Report. — Commended for the excellent quality of the dressed hemp, in all states of progress, from the hackle to “dressed line.”

Roman Cartau, Pskof, Russia.

FLAX.

Report. — Commended for the superior length and quality of the specimens of flax.

Agricultural Museum of the Ministry of Domain, St. Petersburg, Russia.

COTTON.

Report. — Commended for the variety of samples of cotton, viz.: sea island, short staple, and nankin; grown in Turkestan.

Nicholas Vassilieff, Pskof, Russia.

FLAX FIBRES.

Report. — Commended for the very large collection, and the great beauty and strength of the flax fibres.

Basil Maxinof, Kostroma, Russia.

FLAX.

Report. — Commended for a very excellent quality of the collection of flax fibre.

SAXONY.

Louis Herrmann, Jr., Dresden, Saxony.

WIRE GOODS WOVEN $2\frac{1}{2}$ INCHES TO $\frac{3}{4}$.

Report. — Commended for special adaptability to wire screens in jails, outhouses, lawn fencing, for safety and ornament; also, wire screens for sand, gravel, and general purposes in manufactures.

Joseph Meyer, Dresden, Saxony.

LINEN DAMASK TABLE COVERS.

Report. — Commended for superior excellence and beauty, in bleached, half bleached, and border table linen.

S P A I N.

Brotons Brothers, Orihuela, Alicanso, Spain.

FLAX AND JUTE FIBRE.

Report. — Commended for smoothness, length, and strength of fibre, the flax of silky finish.

Manuel Mas & Son, Alicante, Spain.

FABRICS OF ESPARTO GRASS.

Report. — Matting and other fabrics of esparto grass, of excellent quality, well adapted to use, at low cost, and showing the great improvement made in the fibre by careful cultivation.

Jose Tolra & Co., Barcelona, Spain.

MADAPOLLAM AND OTHER FINE COTTON FABRICS.

Report. — Commended for fineness of texture, good quality, and good finish.

Salvador, Pages & Co., Barcelona, Spain.

BLEACHED COTTON GOODS.

Report. — Commended for the very substantial quality, pure finish, and very even yarn, from which they are woven.

La Montruesa de Hilados e Tejidos de Algodon, D. Geronima Ross de la Parra, Province of Santander, La Cordova, Spain.

COTTON FABRICS.

Report. — Bleached cotton fabrics, of even, pure, and very substantial quality, well spun and woven.

La Obrera Mataronense, Malaro, Spain.

COTTON.

Report. — Commended for economy and adaptation to purpose of the heavy cotton fabrics exhibited, as well as excellence in quality.

José Puig & Co., Barcelona, Spain.

COTTON FABRICS.

Report. — Commended for the excellent quality and great variety of the bleached cotton fabrics exhibited, with the trade-mark, "La Fortuna."

Mariano Regordosa & Co., Barcelona, Spain.

COTTON FABRICS.

Report. — Commended for the evenness of fabric and excellence of color, of the Adrianople red yarns.

Oliver & Fouradona, Mataro, Spain.

COTTON FABRICS.

Report. — Commended for the excellence and adaptability to purpose of the cotton sail duck.

Eduardo Borrás, Barcelona, Spain.

PRINTED COTTON FABRICS.

Report. — Commended from consideration of economy in the low price, great variety, and general acceptability of the printed cotton handkerchiefs.

Saladrigas & Brothers, Barcelona, Spain.

PRINTED COTTON FABRICS.

Report. — Commended for variety in design and excellence in finish, combined with economy of production in printed cotton for general use.

La España Industrial, Barcelona, Spain.

PRINTED COTTON FABRICS.

Report. — Commended for very superior excellence in design, color, and fabric in printed cretonnes for furniture purposes, variety and excellence in colors in dyed cambrics and percales, good quality and variety in common prints.

Joaquín Casas & Jover, Barcelona, Spain.

PRINTED COTTON FABRICS.

Report. — Commended for excellence in cloth and printing, neatness in design, and superiority in color in black and indigo blue printed calicoes.

Juan Achón, Barcelona, Spain.

PRINTED COTTON FABRICS.

Report. — Commended for beauty of design, excellence in color and execution in printed cotton fabrics, for furniture covers and curtains.

Ricart & Co., Barcelona, Spain.

PRINTED COTTON FABRICS.

Report. — Commended for great variety and excellence in design, color, and execution in printed cambrics and calicoes, fitted for general use.

José Ferrer & Compania, Barcelona, Spain.

PRINTED COTTON FABRICS.

Report. — Commended for great variety and excellence in design and economy of production in printed calicoes.

Jamondren & Compania, Barcelona, Spain.

PRINTED COTTON FABRICS.

Report. — Commended for excellent quality and great variety of samples of printed calicoes, adapted to ordinary use, and showing great skill and ample resources for production.

Parellada, Flaquer, & Co., Barcelona, Spain.

CORDUROY, COTTON-COLORED FABRICS.

Report. — Commended for variety and excellence of color, strength of fabric, economy and durability.

Valarte, Hermanas, & Conill, Barcelona, Spain.

PIQUE CLOTH, TUFTED.

Report. — Commended for excellence and variety of designs and patterns, superior workmanship and tufting, general excellence.

Juan Conti, Barcelona, Spain.

COTTON TURKISH GARMENTS AND COTTON FABRICS.

Report. — Remarkable for novelty of design in Turkish garments for ladies, colors delicately, exquisitely done, towels, table-covers, material for garments, exceedingly well done. The entire exhibit strictly A, No. 1.

Esteban Ribot & Brothers, Granada, Spain.

FABRICS OF HEMP.

Report. — Commended for great variety of bags, shawls, and other articles made from these fibres, of good quality, useful, and at low cost.

Jaime Sado, Barcelona, Spain.

LINEN FABRICS.

Report. — Commended for beauty and excellence in design and finish of damask table linen and towels.

Sons of Salvador Landa, Calatayua, Zaragoza, Spain.

FLAX FABRICS.

Report. — Commended for excellent quality and adaptability to purpose, as well as economy, of the "hand-spun" linen sheetings.

Marques Caralt & Co., Barcelona, Spain.

HEMP THREADS.

Report. — Commended for economy and adaptability to purpose of the hemp shoe-threads.

Agricultural Society of Castillon, Spain.

HEMP FIBRE.

Report. — Commended for the excellence in quality of the samples of first and second qualities dressed hemp.

Corps of Mountain Engineers, Madrid, Spain.

FABRICS OF ESPARTO GRASS.

Report. — Commended for excellence in quality and design, well suited to their respective purposes, and of peculiar merit for their cheapness.

Valentine de la Conz, Carrescalijo, Spain.

FLAX FIBRE.

Report. — Commended for the excellence and usefulness of the dressed flax.

Battlo Brothers, Barcelona, Spain.

COTTON FABRICS.

Report. — A large and excellent display of bleached cotton fabrics, adapted to ordinary use, and of economical manufacture.

Francisco Garcia Calatrava, Alcobendas, Madrid, Spain.

ESPARTO GRASS.

Report. — Commended for the superior length and strength of the fibre of cultivated esparto grass.

Loring Brothers, Malaga & Granada, Spain.

ESPARTO GRASS.

Report. — Commended for the excellent quality of the esparto grass, showing great improvement in the fibre by careful cultivation and attention.

Enrique Bushell, Hellin, Murcia, Spain.

ESPARTO GRASS.

Report. — Commended for the remarkable length and excellence of the esparto grass, showing the effect of careful cultivation.

Francisco Prast Banon, Hellin, Albacete, Spain.

ESPARTO GRASS.

Report. — Commended for the improvement made by cultivation on the fibres of esparto grass.

Governor of the Jail of Santona, Province of Santander, Spain.

STRAW FABRICS.

Report. — Commended for the great beauty and ingenuity of the different products made from wheat straw by convict labor.

Gervasio Amat, Barcelona, Spain.

ESPARTO MATS.

Report. — Commended for the excellence in quality and economy of production of the mattings of esparto grass exhibited.

S W E D E N .

Malmö Cotton Manufacturing Co., Malmö, Sweden.

COLORED COTTON FABRICS.

Report. — Strong fabrics for common uses; durable and economical; excellent coloring for common goods.

G. Stenbergs (widow), Inköping, Sweden.

LINEN FABRICS.

Report. — Commended for beauty and excellence in design and fabric, of damask table linen.

J. Anderson, Kjardengagarde, Gnosso, Sweden.

WIRE AND SIEVE CLOTH.

Report. — [A peasant making goods by hand.] Commended for very deserving excellence in plainness, economy, and strength.

Bosenlund Cotton Manufg Co., Gotenborg, Sweden.

COTTON DUCK, TWINE, YARN.

Report. — Commended for evenness, strength, and thorough honesty in the fabrics.

J. Th. Berg Naäs, Floda, Sweden.

COTTON YARNS.

Report. — Commended for the evenness of the cotton yarns, and the excellence of the various samples of cotton in its states of preparation for yarn, and, also, the excellence and variety of the colors of which the yarn is dyed.

SWITZERLAND.

Webesei Azmaos, St. Gallen, Switzerland.

WOVEN COLORED COTTON FABRICS.

Report. — Commended for novelty in design, with great and harmonious variety of colors, excellence in smoothness of texture and durability.

Wallenstadt Fancy Cotton Goods Mill, Wallenstadt, Switzerland.

WOVEN COLORED GINGHAMS AND HANDKERCHIEFS.

Report. — Commended for peculiar and excellent combination of colors, strong but fine fabric, great variety, durability of colors and fabric, novelty in method of dyeing and excellence of colors and dyeing.

Henri Fierg, Zurich, Switzerland.

PRINTED COTTON FABRICS.

Report. — Commended for beauty of design, and excellence in coloring and execution, of Adrianople red printing in cambrics, handkerchiefs, shawls, and chintzes.

C. G. Billeter, Zurich, Switzerland.

SINGED COTTON THREAD AND OTHER THREADS.

Report. — Commended for the peculiar softness, evenness, and strength, and special adaptation to the use for which they are intended.

I. Hanhart Solirs, Solivo Dietikon, Zurich, Switzerland.

PRINTED COTTON FABRICS.

Report. — Commended for superior excellence in Adrianople red, black, and orange chintzes.

Gujer Brunner, Ulster Zurich, Switzerland.

COTTON FABRICS.

Report. — Commended for excellence and economy in their exhibit of white and colored cotton bed and table furniture.

J. W. Schlaepfer, Waldstadt, Switzerland.

MULLS AND NAINSOOKS.

Report. — Commended for first-rate fabric, of excellence, evenness, and wove, hand-made and power-loom weaving, of fine and finest qualities, No. of yarns, No. 80–240; width of cloth seventy-five inches and a hundred and sixty inches. Power looms used up to No. 160. Great variety of mulls and nainsooks, general excellence in quality of this specialty of goods, comparative merit as to prices.

M. R. Oetiker, Mannedorf, Zurich, Switzerland.

WHITE AND COLORED QUILTS AND TABLE-CLOTHS.

Report. — Commended as of unusual excellence in style and weaving.

TRINIDAD.

Henry Prestoe, Government Botanist, Trinidad.

VEGETABLE FIBRES.

Report. — Commended for the interesting and varied collection of fibres of vegetable origin, collected and exhibited by him, and their prospective value as subjects for manufacture.

T U R K E Y .

The Government of Turkey, Turkey.

COTTON FABRICS.

Report. — Commended for the large and varied collection of cotton fabrics illustrative of the costumes of the country, and displaying skill in coloring and ingenuity in weaving, as well as adaptability to the wants of the people.

Mourouk Ogion Ohannes, Broussa, Turkey.

COTTON FABRICS.

Report. — Commended for the excellent quality and economical production of the Turkish bath towels.

V E N E Z U E L A .

Government of Venezuela, Venezuela.

COCUIZA FIBRES, COTTON, AND MANUFACTURES OF VEGETABLE FIBRES.

Report. — Commended for the excellent quality of the cotton, white and yellow; the value of the samples of the fibre of the “Fourcroya Gigantea,” called cocuiza, raw and colored; and the excellence and adaptability of the hammocks, halters, girths, and cruppers, made of palm and other fibres.

A D D E N D U M .

Ph. J. Scholler & Sons, Rheinphal, Bavaria.

WIRE CLOTH DOUBLE TWILLED.

Report. — Commended for utility, especially in sifting potato meal, sugar, starch, and all meals of that description.

AWARDS TO AMERICAN EXHIBITORS.

GROUP IX.

JUDGES.

American.

JOHN L. HAYES	Cambridge, Mass.
ELLIOT C. COWDIN, <i>President</i>	New York.
CHARLES LE BOUTILLIER	Philadelphia.
CHARLES J. ELLIS	"
J. D. LANG	Vassalborough, Maine.

Foreign.

Consul GUSTAV GEBHARD, <i>Secretary</i>	Germany.
THEODORE BOCHNER, Jr.	Austria.
HENRY MITCHELL	Great Britain.
Dr. MAX WEIGERT	Germany.
LOUIS CHATEL	France.
CARL ARNBERG	Sweden.
HAYAMI KENZO	Japan.
JOHN G. NEESER	Switzerland.
AUGUST BEHMER	Egypt.
ALBERT DANINOS	Turkey.

WOOL AND SILK FABRICS, INCLUDING THE MATERIALS AND THE MACHINERY.

WOVEN AND FELTED GOODS OF WOOL, AND MIXTURES OF WOOL.

1. CLASS 667. — Wool in the fleece, in bales, and carded.
2. CLASS 235. — Card wool fabrics — yarns, broadcloth, doeskins, fancy cassimeres. Felted goods. Hat bodies.
3. CLASS 236. — Flannels — plain flannels, dometts, opera and fancy.
4. CLASS 237. — Blankets, robes, and shawls.

5. CLASS 238. — Combed-wool fabrics — worsteds, yarns, dress goods for women's wear, delaines, serges, poplins, merinos.
6. CLASS 239. — Carpets, rugs, &c. — Brussels, Melton, tapestry, tapestry Brussels, Axminster, Venetian, ingrain, felted carpetings, druggets, rugs, &c.
7. CLASS 240. — Hair — alpaca, goat's hair, camel's hair, and other fabrics mixed or unmixed with wool.
8. CLASS 241. — Printed and embossed woollen cloths, table-covers, patent velvets.
9. CLASS 522. — Machines for the manufacture of woollen goods.

SILK AND SILK FABRICS, AND MIXTURES IN WHICH SILK IS THE PREDOMINATING MATERIAL.

10. CLASS 242. — Cocoons and raw silk as reeled from the cocoon; thrown or twisted silks in the gum.
11. CLASS 243. — Thrown or twisted silks, boiled off or dyed; in hanks, skeins, or on spools.
12. CLASS 244. — Spun silk yarns and fabrics, and the materials from which they are made.
13. CLASS 245. — Plain woven silks, lutestrings, sarcenets, satins, serges, foulards, tissues for hat and millinery purposes, &c.
14. CLASS 246. — Figured silk piece goods, woven or printed. Upholstery silks, &c.
15. CLASS 247. — Crapes, velvets, gauzes, cravats, handkerchiefs, hosiery, knit goods, laces, scarfs, ties, veils, all descriptions of cut and made up silks.
16. CLASS 248. — Ribbons — plain, fancy, and velvet.
17. CLASS 249. — Bindings — braids, cords, galloons, ladies' dress trimmings, upholsterers', tailors', military, and miscellaneous trimmings.
18. CLASS 520. — Machines for the manufacture of silk goods.

CALIFORNIA.

Mission Woollen Co., San Francisco, Cal.

BLANKETS.

Report. — Blankets, carriage and lap robes, made of Pacific coast wools, the higher qualities unsurpassed in excellence of fabrication, softness of finish, and tastefulness of borders.

CONNECTICUT.

Niantic Woollen Co., East Lyme, Conn.

COTTON WARP TWEEDS.

Report. — Commended for a three-fourths cotton warp tweed, tastefully mixed with silk noils, for “Knickerbocker” effects, at cheap prices.

Tunxis Mills, Poquonnock, Conn.

COLORED WORSTED YARNS.

Report. — Commended for an admirable collection of colored wools and worsted yarns, in a great variety of colors and mixtures; adapted for both dress purposes and clothing goods, and for excellence of dye and colors.

Clinton Mills Co., Norwich, Conn.

BLANKETS.

Report. — Blankets of low grade and cheap prices.

Read Carpet Co., Bridgeport, Conn.

CARPETS AND CARPET TERRY.

Report. — Commended for two-ply ingrain carpets, excellent in design and finish; for originality in weaving the same with variegated yarns, increasing the number of colors; and for all-wool carpets, terries, serviceable and novel; adapted for libraries and offices.

Thames River Worsted Co., Norwich, Conn.

SPINNING-FRAME.

Report. — Commended for a ring and traveller spinning-frame for worsted.

Novelty Weaving and Braiding Works, Tobias Kolm, Hartford, Conn.

BRAIDS.

Report. — A very fine exhibit of braids; well made in every respect as to quality and color.

New England Manufacturing Co., Rockville, Conn.

WOOLLEN CASSIMERES.

Report. — Fancy cassimeres of unsurpassed excellence in material, fabric, and finish; the designs tasteful, novel, and varied.

The Broad Brook Co., Broad Brook, Conn.

FANCY CASSIMERES.

Report. — An excellent exhibit of fancy cassimeres, in great variety; substantial, well made, and of good designs. Also, meritorious indigo blue coatings.

Union Manufacturing Co., Wolcottville, Conn.

THREE-FOURTHS BLACK DOESKINS.

Report. — Three-fourths black doeskins; excellent in fabric, color, and finish.

DELAWARE.

Taylor & Mullen, Newark, Del.

CARPETS AND MATS.

Report. — A creditable exhibit of rag carpets and mats.

MAINE.

Newichawanick Co., South Berwick, Me.

HORSE BLANKETS.

Report. — An excellent exhibit of horse-blankets, in great variety of styles.

Bates Manufacturing Co., Lewiston, Me.

BEAVERS AND REPELLANTS.

Report. — Well-made beavers and repellants.

Worumbo Manufacturing Co., Lisbon Falls, Me.

OVERCOATINGS.

Report. — Black and colored moscow beavers of excellent fabric, color and finish.

Knox Woollen Co., Camden, Me.

PAPER MAKERS' FELTS.

Report. — An exhibit of paper makers' felts unsurpassed in excellence.

MASSACHUSETTS.

United States Bunting Co., Lowell, Mass.

WOOLLEN BUNTING, MOREENS, AND DAMASKS.

Report. — Commended for an excellent show of bunting, made of English and Canadian wool; and for originality of process of striping and forming design and pattern; also for moreens and damaska, of creditable manufacture and considerable merit.

William Walkshaw, Saxonville Mills, Mass.

DYEING.

Report. — A considerable exhibit of colors, in great variety, in woollen and worsted yarns.

Hinsdale Bros., Hinsdale, Mass.

KERSEYS AND COATINGS.

Report. — Commended for light-colored kerseys of good finish, and beautiful and even shades; and for excellent coatings.

George W. Bond, Boston, Mass.

WOOLS, MOHAIR, AND ALPACA.

Report. — A very large and complete selection of wool, mohair, and alpaca, consisting of one hundred and ninety specimens, all of distinct qualities and varieties, collected from every wool-growing country in the world, and adapted for the manufacture of all fabrics of which wool is a component part. The exhibit is admirably arranged for scientific investigation.

Hamilton Woollen Mills, Southbridge, Mass.

REPS AND DELAINES.

Report. — A very handsome and complete assortment of three-fourths printed reps and delaines, in strong patterns and designs, adapted for general consumption and at low prices.

A. B. Prouty, Worcester, Mass.

CARD-SETTING MACHINE.

Report. — A card-setting machine, excellent in construction and execution.

Rodney Hunt Machine Co., Orange, Mass.**FULLING MILL.**

Report. — A useful fulling mill.

Germania Mills, Holyoke, Mass.**ESKIMOS BEAVERS AND DOESKINS.**

Report. — Three exhibits of fur beavers, elysians, and eskimos; the germania beavers, in black and colors, are especially commended for excellence of texture and finish.

Groveland Mills, South Groveland, Mass.**FLANNELS.**

Report. — An assorted exhibit of red shaker, Martha Washington, white, light red and blue flannels, both in twenty-seven and thirty-six inch widths, all of good fabrication, at moderate cost.

MICHIGAN.

The State of Michigan.**WOOL.**

Report. — A collective exhibit of samples of wool produced in the State, contributed by one hundred and sixteen persons in ten counties; four hundred and sixty-one samples being of merino wool and grades, and one hundred and ninety-six samples being of long combing wool of English blood; the collection is illustrative of the high character of an annual product of wool in the State, estimated at eight million pounds.

MISSISSIPPI.

Mississippi Mills, Wesson, Miss.**WOOL FILLING JEANS.**

Report. — An exhibit of doeskin jeans, of substantial manufacture, adapted to the wants of the laboring classes.

NEW HAMPSHIRE.

Sawyer Woollen Mills, Dover, N. H.

FANCY CASSIMERES AND SUITINGS.

Report. — Fancy cassimeres and kerseys in blacks and colors, of high intrinsic merit, free from cotton, shoddy, or flecks; the styles neat, and the prices for the quality low; the silk-mixed and the double and twist specially commended.

NEW JERSEY.

Farrington & Kinsey, Rahway, N. J.

EXTRACT WOOLS.

Report. — Extract wools from old garments of cotton and wool, from which the cotton is destroyed by a chemical process, without injury to the wool.

William Strange & Co., Paterson, N. J.

RIBBONS.

Report. — Commended for an extremely fine exhibit of plain and fancy ribbons, of good materials, well made in every respect; also, for sash and millinery ribbons of great beauty and superior quality.

Camden Woollen Mills, Camden, N. J.

COTTON WARP, REPELLANTS, AND FLANNELS.

Report. — Cotton warp, repellants, flannels, cloakings, and knickerbocker goods, at low prices.

Danforth Locomotive and Machine Co., Paterson, N. J.

SILK MACHINERY.

Report. — A collection of silk machinery, embracing winding and spinning frame for singles and for doubling.

NEW YORK.

Baltic Woollen Mills, New York, N. Y.

REPELLANTS.

Report. — Medium grades of repellants, in black and colors, of good manufacture and cheap prices.

J. M. Kirkpatrick, Utica, N. Y.

MERINO WOOL.

Report. — Six samples of fine merino wool, of good quality and fibre.

James Torrence, Utica, N. Y.

WOOLS.

Report. — Twelve samples of merino, Leicester, and half-blood wools, of excellent quality and considerable merit.

Waterloo Woollen Manufacturing Co., Waterloo, N. Y.

SHAWLS.

Report. — Plain and fancy woollen shawls, notable for their brilliancy of colors and beauty of styles.

Alfred Dolge, New York, N. Y.

FELTS.

Report. — A superb exhibit of piano felt, made from Silesian wool; jewellers' and marble masons' polishing felts, all of creditable fabrication.

J. & H. Hutchinson, Brooklyn, N. Y.

MATS.

Report. — A capital exhibit of cocoa and brush mats, with and without wool borders, excellent in design and quality and at fair prices.

Alexander Smith & Sons, Carpet Co., Yonkers, N. Y.

CARPETS.

Report. — A beautiful display of Axminster and tapestry Brussels and tapestry velvet carpets; the latter excellent in texture and design; the Axminster carpets distinguished for great beauty of design, color,

and texture, and remarkable as made by original automatic machinery introduced by the senior exhibitor.

Eickmeyer Hat Blocking Machine Company, New York, N. Y.

HAT-MAKING MACHINERY.

Report. — Ingenious, novel, and highly valuable labor-saving machinery, adapted for the making of hats; extensively used in this manufacture in place of hand processes: to wit, a hat-tip stretching-machine, a universal hat-pouncing machine, and hat-ironing machine.

James Roy & Co., Watervliet Mills, West Troy, N. Y.

SHAWLS AND WORSTED SUITINGS.

Report. — An excellent and varied display of worsted suitings and plaid shawls; the former of superior manufacture and design, and the shawls especially creditable for good taste in color and design, with cheap cost.

C. H. & F. H. Stott, Stottsville, N. Y.

FLANNELS.

Report. — Cotton and wool mixed twilled flannels, for bathing robes and other purposes; also, plaid flannels of a better grade; all noticeable for cheap prices.

L. Dryfoos & Co., New York.

FELT SKIRTS.

Report. — Commended for a handsome exhibit of felt skirts and for originality of design in embroidery.

OHIO.

E. J. Hiatt & Brothers, Chester Hill, Ohio.

OHIO WOOL.

Report. — Fleece of excellent quality and growth, of Ohio wool, well bred, and adapted for combing.

Albert Quigley, Cadiz, Ohio.

MERINO WOOL.

Report. — Five samples of fine merino wool, of good quality and fibre, and adapted either for clothing or combing purposes.

Walter Craig, Cadiz, Ohio.

WOOL.

Report. — Seventeen samples of pure merino wool, of very superior quality and of considerable merit.

J. B. Jamison, Cadiz, Ohio.

WOOL.

Report. — Eight samples of Spanish merino wool, of very superior quality and growth.

J. M. Holmes, Short Creek, Ohio.

MERINO WOOL.

Report. — Twelve samples of excellent merino wool, of good staple and fibre.

Henry Boyles, Cadiz, Ohio.

MERINO WOOL.

Report. — Six samples of Spanish merino wool, of very superior quality.

W. B. Law, Connotton, Ohio.

MERINO WOOL.

Report. — Thirteen samples of fine Spanish merino wool, of superfine quality and growth.

Isaac Thomas, Short Creek, Ohio.

WOOL.

Report. — Twelve samples of fine merino wools, of superior quality and growth.

S. S. Campbell, Cadiz, Ohio.

WOOL.

Report. — Twenty-four samples of merino wool, of excellent quality and good staple, well adapted for the manufacture of cashmeres and merinos.

Andrew Jamison, Short Creek, Ohio.

MERINO WOOL.

Report. — Eleven samples of fine merino wool, of considerable merit and good fibre.

M. L. Birney, Bowerstown, Ohio.

WOOL.

Report. — Twelve samples of fine Spanish merino, of superior quality and growth.

W. W. Jamison, Cadiz, Ohio.

MERINO WOOL.

Report. — Eleven samples of merino wool, of good quality and fibre, well adapted for combing.

W. O. Harrah, Cadiz, Ohio.

MERINO WOOL.

Report. — Eleven samples of pure merino wool, of superior quality and good staple.

Hervey Fox & Co., Urbana, Ohio.

STOCKING YARNS AND TWEEDS.

Report. — Excellent indigo-dyed stocking yarns; also, tweeds, honest and substantial in material and make.

Piqua Woollen Mills, F. Gray O'Farrell & Co., Piqua, Ohio.

PAPER-MAKERS' WET AND PRESS FELTS AND JACKETS.

Report. — A creditable exhibit of Fourdrinier print, cylinder print, wrapping, second press, and jacket felts for paper-makers' use.

Shale & Benninghofen, Hamilton, Ohio.

PAPER-MAKERS' FELTS.

Report. — Well-made felts for paper-making.

Beckman & Co., Cleveland, Ohio.

WOOL SHODDIES.

Report. — A full assortment of all-wool shoddies, comprising about seventy-eight varieties of colors and mixtures, beautifully arranged and of considerable merit.

OREGON.

M. Wilkins, Eugene City, Oregon.

COMBING WOOL.

Report. — An exhibit of a sample of Cotswold wool, with twelve samples of wool, improved by a series of crossing pursued for many years, of high-bred Cotswold bucks on high-bred Oxfordshire Down ewes, producing a combing wool retaining the length of the original Cotswolds, but with greatly increased fineness and softness, and total absence of hair.

Oregon City Woollen Mills, Oregon.

FANCY CASSIMERES AND BLANKETS.

Report. — Fancy cassimeres, substantial in fabric, of excellent finish, and good designs; also, blankets, of good quality, — all marked for their cheapness, resulting from the availability of Oregon wools, at low cost.

S. G. Reed, Portland, Oregon.

LONG COMBING WOOL.

Report. — Three samples of Leicester combing wool, and three samples of Cotswolds combing wool, noticeable for long staple and bright lustre.

PENNSYLVANIA.

Jacob Senneff, Philadelphia, Pa.

FLAT METALLIC-EYE HEDDLE.

Report. — Commended as an improvement upon the cotton and varnished heddles, being less liable to abrade the warp.

Thomas Potter, Sons, & Co., Philadelphia, Pa.

OIL CLOTHS.

Report. — Commended for their very great variety, excellent quality; numerous, original, and artistic designs, and rich finish and colors; admirable in every way.

James Kirkman, Chester, Pa.

COTTON AND WOOL DOESKINS.

Report. — An exhibit of Union doeskins (or Kentucky Jeans), in a variety of mixtures, at low prices, and adapted to common use.

Philadelphia Worsted Spinners' Association, Philadelphia, Pa.

WORSTED YARNS.

Report. — A most complete and admirable collection of extra fine yarns, from numbers fifty to two hundred; also, colored and mixed yarns, in beautiful colors and great variety; and zephyr braid, cassimere, genappe, shawl, knitting, floss, and upholstery yarns; all very evenly spun; well adapted for the purposes intended, and excellent in every respect; mostly spun from American wool.

Monitor Mills, Philadelphia, Pa.

CARPETS.

Report. — An excellent exhibit of two and three ply ingrain, specially noticeable for originality of certain patriotic designs, and of good quality, and fair prices.

B. A. Earl, Philadelphia, Pa.

WOOL OIL MACHINERY.

Report. — A useful wool oiling attachment, for carding machines.

Dienelt & Eisenhardt, Philadelphia, Pa.

GEE NON-SHUTTLE POWER CARPET LOOM.

Report. — A needle loom of ingenious construction, and a Jacquard loom for weaving silk scarfs.

Wolfenden, Shore, & Co., Cardington, Pa.

CLOTH LOOM.

Report. — A general-purpose cloth-loom, of simplicity of motions and reasonable price.

M. A. Furbush & Son, Philadelphia, Pa.

SET OF CARDING MACHINES.

Report. — A series of carding machines, well built, and showing several very valuable improvements. Also, a Murkland loom; showing simplicity, excellence of finish, in work, and great production.

Ivins, Dietz, & Magee, Philadelphia, Pa.

CARPETS.

Report. — The only exhibit of cotton and wool, and cotton ingrain, of excellent designs, at very low prices.

Dorman Bros. & Co., Philadelphia, Pa.

POWER CARPET-LOOM.

Report. — An ingenious needle-loom, in which the colored weft to be thrown is selected by a Jacquard, and raised so as to bring it within the range of the reciprocating needle; this carries it half-way across the shed, where it is met by a hook, which, in retreating, carries the bight of the weft to the other selvage, where it is knit in by a latch needle.

Mrs. E. B. Shapleigh, Philadelphia, Pa.

HAND-MADE RUGS.

Report. — Two rugs made of carpet yarns, by the process denominated hooking; being a novel and tasteful adaptation, from a domestic industry largely pursued in the state of Maine, and capable of extensive application by ladies, for household decoration.

S. B. & M. Fleisher, Philadelphia, Pa.

BRAIDS.

Report. — A fine exhibit of the "Star" alpaca braids, of superior manufacture, perfect in colors, and of the best materials, placing this braid in the first rank.

Henry Noske, Philadelphia, Pa.

PAPER-MAKERS' FELTS.

Report. — Well-made paper-makers' felts.

J. Ledward & Son, Chester, Pa.

COTTON AND WOOL DOESKINS.

Report. — Cotton and wool doeskins, of good and substantial make, and at low prices; adapted for a large demand in agricultural districts.

Conshocken Woollen Mills, Conshocken, Pa.

BEAVERS AND DOESKINS.

Report. — Moscow, castor, and doeskin beavers, of medium grades;

well made for the purposes intended, and at moderate prices ; the diagonal beavers especially commended.

Woodvale Woollen Mills, Johnstown, Pa.

FANCY CASSIMERES.

Report. — Fancy cassimeres of medium grades, substantially made, of neat design, and at moderate prices.

RHODE ISLAND.

Peckham Manufacturing Co., Providence, R. I.

KENTUCKY JEANS, DOESKINS, AND WOOLLEN YARNS.

Report. — Kentucky Jeans and doeskins, smooth in finish and uniform in shade. Also, an excellent exhibit of woollen yarns, in great variety of shades.

Robert Rodman, Lafayette, R. I.

DOESKIN JEANS.

Report. — Humboldt jeans, of cotton warp and all-wool fillings ; of substantial make and intrinsic worth, for common wear.

Woonsocket Machine Co., Woonsocket, R. I.

SELF-ACTING SPINNING MILL.

Report. — A self-acting spinning mill of excellent construction and good workmanship.

Enterprise Co., Woonsocket, R. I.

SHOE LASTINGS.

Report. — A very creditable exhibit of 11, 14, and 16 thread lastings, of honest make and good quality for the number of threads. The goods are well adapted for the manufacture of boots and shoes.

R. Howard & Sons, Apponaug, R. I.

WOOLLEN YARNS.

Report. — Woollen yarns, well spun and of good colors.

Wanskuck Company, Providence, R. I.

OVERCOATINGS.

Report. — A beautiful exhibit of fancy elysians and fur beavers; excellent in design and texture. Their Devonshire kerseys, in black and colors, especially commendable.

Lippitt Woollen Co., Woonsocket, R. I.

OVERCOATINGS AND FANCY CASSIMERES.

Report. — A good exhibit of all-wool fancy elysians and fur beavers, of varied patterns and colors, in low and medium grades.

VERMONT.

Parks & Woolson, Springfield, Vt.

CLOTH SHEARING AND BRUSHING MACHINES.

Report. — A cloth-shearing and a cloth-brushing machine, both of very good construction and workmanship.

A D D E N D A.

CALIFORNIA.

Joseph Neumann, San Francisco, Cal.

RAW SILK AND SILK COCOONS.

Report. — A very good collection of cocoons and raw silk of a variety of races, highly commendable for the successful attempts in the introduction of this important branch of industry.

KANSAS.

E. V. De Boissiere, Williamsburg, Kansas.

SILK COCOONS.

Report. — Commended for successful attempts to raise silk-worms, and for cocoons of good quality.

KENTUCKY.

Robert W. Scott, Franklin County, Kentucky.

WOOL.

Report. — Commended for two pelts with wool illustrative of fleeces

from sheep claimed to be a distinct breed produced by the exhibitor, the wool of a fair quality for combing purposes, and for two excellent pelts from Angora goats.

NEBRASKA.

Moses Stocking, Wahoo, Saunders County, Nebraska.

WOOL.

Report. — One fleece of merino ram's wool, of good weight and excellent quality.

NEW JERSEY.

Weidmann & Greppo, Paterson, N. J.

DYED SILK.

Report. — Commended for excellent production of black and colored dyed silk, comparing well with the best European establishments.

Frederick Baare, Paterson, N. J.

SILK GOODS.

Report. — Commended for black figured silks, made in an improved and superior manner; also, for twenty-six-inch millinery goods of good manufacture.

S. M. Mayenberg, Paterson, N. J., and New York, N. Y.

SILKS AND UPHOLSTERY SATINS.

Report. — Commended for very well-made millinery silks and upholstery satins, of superior quality and finish, also, for ladies' scarfs of excellent color and design.

NEW YORK.

American Silk Label Manufacturing Co., New York, N. Y.

WOVEN SILK LABELS.

Report. — A well-made fac-simile of the signatures to the Declaration of Independence.

Hamil & Booth, Paterson, N. J., and New York, N. Y.

PLAIN AND FIGURED SILKS.

Report. — A very fine exhibit of figured dress and millinery silks, plain satins, serges, and silk ribbons, of excellent manufacture and material.

New York Woven Manufacturing Label Co., New York, N. Y.

WOVEN SILK LABELS.

Report. — Woven silk labels of very good execution.

OHIO.

William Croskey, Hopedale, Harrison County, Ohio.

WOOL.

Report. — An exhibit of twelve samples of Saxony wool, of the highest excellence.

OREGON.

M. Wilkins, Lane County, Oregon.

WOOL.

Report. — Fleece and combed wool, of fine fibre and healthy growth, resembling Australian ; also improved Oxfordshire and Leicester.

PENNSYLVANIA.

Werner, Itschner, & Co., Philadelphia, Pa.

SILK RIBBONS.

Report. — Commended for faille, fancy, and Jacquard ribbons of very good manufacture, both as to color and to combination of material ; also for a good display of very suitable hat-bands.

WEST VIRGINIA.

C. H. Beall, Brooke County, West Virginia.

WOOL.

Report. — An admirable exhibit of fleeces of American merino wool from two bucks and nine ewes, with a case containing thirty-three samples, all the samples being of exceptional excellence.

S. A. Cockayne, Moundsville, Marshall County, West Virginia.

WOOL.

Report. — One fleece of good merino wool.

John Ingram, Poplar Spring, Marshall County, West Virginia.

WOOL.

Report. — Ten fleeces of excellent merino combing and beautiful merino clothing wools.

Ninian Beall, Ohio County, West Virginia.

WOOL.

Report. — An exhibit of Saxony fleeces, two bucks and two ewes, of fineness characteristic of the race.

AWARDS TO FOREIGN EXHIBITORS.

GROUP .IX.

JUDGES.

American.

JOHN L. HAYES, ...	Cambridge, Mass.
ELLIOT C. COWDIN, <i>President</i>	New York.
CHARLES LE BOUTILLIER	Philadelphia.
CHARLES J. ELLIS	„
J. D. LANG	Vassalborough, Maine.

Foreign.

Consul GUSTAV GEBHARD, <i>Secretary</i>	Germany.
THEODORE BOCHNER, Jr.	Austria.
HENRY MITCHELL	Great Britain.
Dr. MAX WEIGERT	Germany.
LOUIS CHATEL	France.
CARL ARNBERG	Sweden.
HAYAMI KENZO	Japan.
JOHN G. NEESER	Switzerland.
AUGUST BEHMER	Egypt.
ALBERT DANINOS	Turkey.

AFRICA.

Orange Free State, Africa.

WOOL.

Report.— One bale of mohair, and two bales of merino clothing-wool, all of excellent quality.

ARGENTINE REPUBLIC.

Province of Entre Rios, Argentine Republic.

RAW WOOL.

Report. — An assortment of small samples of fine merino wool of superior quality and long staple.

Government of the Argentine Republic.

WOOLLEN MANUFACTURES.

Report. — A beautiful collection of vicuña shawls and ponchos, carpets, and tapestries. Among the vicuña shawls exhibited were some especially to be mentioned, made by Josva Madueno, Samuel N. Lafone Quevedo, of Catamarca, M. Malbran, of Catamarca, and Teresa Luraschi, of Catamarca. The above goods are of the highest texture and merit.

Carlos J. Guerreno, Province of Buenos Ayres, Argentine Republic.

MERINO WOOL.

Report. — Fleeces of unwashed merino wool of superior quality and fibre, adapted to the manufacture of cashmeres and merinos.

Nazar & Brothers, Buenos Ayres, Argentine Republic.

MERINO WOOL.

Report. — A large assortment of samples of merino wool, in great variety of staple and of good quality.

Francisco Chas & Son, Province of Buenos Ayres, Argentine Republic.

WOOL.

Report. — One fleece of unwashed wool, weighing thirty-one pounds, of fair quality and excellent growth.

Jorge Stegman, Province of Buenos Ayres, Argentine Republic.

MERINO WOOL.

Report. — One fleece of healthy, full-grown merino wool, weighing twenty-one pounds, of good staple and fibre, and adapted for combing purposes.

Wilfred Latham, Province of Buenos Ayres, Argentine Republic.

MERINO WOOL.

Report. — Two fleeces of merino combing wool, of excellent quality and fibre; also samples of fine merino wool.

Emilo Duportal, Province of Buenos Ayres, Argentine Republic.

WOOL.

Report. — A very good exhibit of sheep-skin wool, very heavy, and of good quality, and nine-inch staple; also, four fleeces excellent combing wool, weighing about twenty-three pounds each.

Samuel B. Hale, Province of Buenos Ayres, Argentine Republic.

MERINO WOOL.

Report. — Six fleeces of merino combing wool, of very superior quality, well bred, and long staple; almost equal to Australian wool, and well adapted for the manufacture of merinos and Italian cloths.

Provincial Commission, Province of Buenos Ayres, Argentine Republic.

WOOL.

Report. — Samples of merino and other wools, in different classes and great varieties; the staple in some instances being eight inches long; also, sheep-skin, Cordova and goat's wool: all of excellent growth and great weight.

AUSTRALIA.

Fredr. Wurm, Adelaide, South Australia.

SILK COCOONS.

Report. — A very good exhibit of cocoons, remarkable for such a short period of culture. The yellow silk shows great tenacity and is very clean.

Mrs. Bladen Neill, Melbourne, Victoria, Australia.

RAW SILK AND SILK COCOONS.

Report. — A good exhibit of raw silk and cocoons, highly creditable from the fact that this branch of industry has only lately been introduced. The raw silk, particularly from the reproduction of the Japanese and Grenoble cocoons, has great elasticity.

Mrs. Ann Timbrell, Collingwood, Victoria, Australia.

RAW SILK COCOONS.

Report. — A good display of raw silk cocoons of a variety of races, very firm, and of good quality.

C. F. Chubb, Ipswich, Queensland, Australia.

RAW SILK COCOONS.

Report. — Good variety of raw silk cocoons of different races.

J. McDonald, Queensland, Australia.

SILK COCOONS.

Report. — A very creditable assortment of raw silk cocoons of good quality.

Commissioners for Victoria, Melbourne, Victoria, Australia.

RAW WOOL.

Report. — Washed lamb's wool, greasy wool, and Victoria merino ; all well selected, and of excellent growth and quality.

Thomas F. Cumming, Stony Point, Victoria, Australia.

MERINO WOOL.

Report. — Sample of very superior combing greasy merino wool, of excellent quality and growth.

William Kemp, Adelaide, South Australia.

WOOL.

Report. — Twelve sheepskins of excellent growth and quality, very good of their kind.

Fenwick & Scott, Queensland, Australia.

WOOL.

Report. — A large collection of samples of Australian wool, most of which are of high merit, great length of staple, and superior quality.

G. H. Davenport, Headington Hill, Queensland, Australia.

WOOL.

Report. — A most choice exhibit of merino combing wool, of the finest quality, long staple, and excellent in every respect, especially remarkable for its length and richness of fibre.

C. B. Fisher, Headington Hill, Queensland, Australia.

MERINO WOOL.

Report. — Well-bred merino wool, of exceedingly fine quality, good staple, and growth.

John Wilson, Lismore, Victoria, Australia.

WOOL.

Report. — Three fleeces of greasy merino lambs, ewes, and wethers, of good quality and growth, adapted both for combing and clothing purposes.

W. & N. G. Elder, Elder, Rookwood, Victoria, Australia.

WOOL.

Report. — An excellent exhibit of merino lamb's, ewe's, and wether wool, of very superior quality and growth.

R. Goldsborough & Co., Melbourne, Victoria, Australia.

WOOL.

Report. — A very considerable variety of greasy and washed merino wool, most of which is of very superior quality and growth, and adapted for both clothing and combing purposes.

George Arnold & Co., Melbourne, Victoria, Australia.

WOOL.

Report. — Five cases of wool, containing thirty fleeces of washed and greasy merinos; also, Lincoln, Leicester, and cross-bred. The merinos are excellent in every respect, and the Leicester crosses are of considerable merit.

Timms Brothers, Mount Hesse, Victoria, Australia.

WOOL.

Report. — Samples of ewe and wether merinos, hot-water washed, of very superior quality and fibre.

Hastings, Cunningham, & Co., Melbourne, Victoria, Australia.

WOOL.

Report. — A most complete assortment of fine washed combing merino wool, also, greasy ram's wool, and cross-bred and Lincoln ewe fleeces. The merino wool is excellent in every respect, and reflects great credit on the growers.

Alexander Armstrong, Worramtine, Victoria, Australia.

WOOL.

Report. — A very creditable exhibit of washed and greasy merino wool, of excellent quality and growth.

B. C. Parr, Queensland, Australia.

AUSTRALIAN WOOL.

Report. — Australian wool, of superior quality, and in good condition; high-class wool in every respect.

George Clark, East Talgai, Queensland, Australia.

MERINO WOOL.

Report. — Australian merino wool, of very superior quality and fibre, and of high merit.

Gore & Co., Yandilla, Queensland, Australia.

MERINO WOOL.

Report. — A very good exhibit of merino wool of fine quality, good staple, and healthy growth.

Simpson & Co., Bon Acora, Queensland, Australia.

WOOL.

Report. — Combing merino wool, of very superior quality, staple, and growth.

F. R. White, Blandford, New South Wales, Australia.

WOOL.

Report. — Commended for combing merino wool, of superior growth and quality; also, for several fleeces of Saxon merino wool, of excellent growth and staple.

J. B. Bettington, Merrieva, New South Wales, Australia.

WOOL.

Report. — Commended for two cases of Saxon merino combing wool, of fine quality, good staple, and growth. Also, for greasy wool of very superior quality and merit.

G. H. Cox, Mudgee, New South Wales, Australia.

WOOL.

Report. — An extensive and excellent exhibit of Saxon merino combing wool, beautifully washed, of the finest quality, and very high merit.

Henty & Balfour, Albury, New South Wales, Australia.

WOOL.

Report. — Two cases of combing, merino wool, of very superior quality and growth, and excellent in every respect.

E. K. Cox, Mudgee, New South Wales, Australia.

WOOL.

Report. — Several fleeces of Saxon merino combing wool, well washed, of excellent quality, fibre, and staple, and of very high merit.

E. & A. Tindal, Burrajan, New South Wales, Australia.

WOOL.

Report. — Commended for fine washed combing Saxon merino wool, of very superior quality and fibre, and of high merit; also, for greasy combing wool, of superior quality.

Charles Clark, Queensland, Australia.

ANGORA WOOL.

Report. — Fleece of pure Angora wool, of excellent quality, good staple, and rich lustre.

John Lang Currie, Victoria, Australia.

WOOL.

Report. — Three fleeces of lamb's and merino wool, of superior quality, and in good condition, the lamb's wool is especially good.

G. L. Lethbridge, Singleton, New South Wales, Australia.

WOOL.

Report. — Cases of Saxon merino greasy combing wool, of good fibre and quality.

A. N. Gilbert, Warwillah, New South Wales, Australia.

WOOL.

Report. — Saxon merino combing wool, of fine quality, good staple, and healthy growth.

E. & A. Bowman, Rotherwood, New South Wales, Australia.

WOOL.

Report. — Commended for greasy merino clothing wool, of superior quality, and adapted for fine cloths; also, for several cases of Saxon merino combing wool, of good quality and fibre.

F. Brown & Co., Tuppal, New South Wales, Australia.

WOOL.

Report. — Case of excellent combing merino wool, of first-rate quality, and, if free from burs, would be most choice wool.

Hon. James MacLanachan, Ballochmyle, Tasmania, Australia.

WOOL.

Report. — Fleeces of pure merino ram's wool, in the grease, of excellent growth and quality, weighing from ten to eleven pounds each.

Thomas Russell, Barunah Plains, Victoria, Australia.

WOOL.

Report. — Hot-water washed wool, of excellent quality and high merit.

Victorian Woollen Cloth Co., Victoria, Australia.

WOOLLENS.

Report. — Shawls, tweeds, and broad-cloths, made of pure wool, and of honest and substantial manufacture. Very creditable for a new country.

John McVean, Woolloomoonoo, New South Wales, Australia.

MERINO WOOL.

Report. — Combing merino wool, of fine fibre and staple, and very superior quality.

Geo. Synnot & Co., Geelong, Victoria, Australia.

LINCOLN WOOL.

Report.—Samples of well-grown Lincoln wool, of good staple and rich fibre.

A. Loder, Colley Creek, New South Wales, Australia.

WOOL.

Report.—Commended for an excellent exhibit of fine merino clothing wool, of superb quality, and adapted for the manufacture of the best superfine cloths; also, for combing merino wool, of very choice quality, staple, and fibre.

A. H. Lowe, Dynevor, New South Wales, Australia.

WOOL.

Report.—Angora goat's wool, of fine growth, and high lustre, adapted for the manufacture of mohair fabrics; capable of further improvement.

John Allen, Burrangong, New South Wales, Australia.

WOOL.

Report.—One case of Saxon merino combing wool, of very fine quality, and good staple; also, well-bred.

Wm. Lang, Wargam, New South Wales, Australia.

WOOL.

Report.—Excellent samples of greasy, wether, and hogget wool, of very superior quality and staple.

F. & A. Cox, Mudgee, New South Wales, Australia.

WOOL.

Report.—A very superior exhibit of fine Saxon merino combing wool, excellent in quality and fibre.

D. H. Campbell, Cunningham Plains, New South Wales, Australia.

WOOL.

Report.—Commended for one case of Rambouillet combing wool, of superior quality, healthy growth, and good staple; also, for clothing wool adapted for fine cloths.

W. A. Broadribb, Moolbong, New South Wales, Australia.

WOOL.

Report. — Fine combing merino wool, of good staple and quality, and adapted for the manufacture of cassimeres.

L. Learmonth, Groongal, New South Wales, Australia.

WOOL.

Report. — Cases of fine combing merino wool, of excellent quality, fibre, and growth. A most choice selection.

E. B. Hulme, Burrowa, New South Wales, Australia.

WOOL.

Report. — Saxon merino combing wool, in the grease, of good fibre, quality, and growth; also, very heavy fleeces.

P. G. King, Goonoo-Goonoo, New South Wales, Australia.

WOOL.

Report. — Several fleeces of superior combing merino wool, excellent in quality and staple.

Clive & Hamilton, Collaroy, New South Wales, Australia.

WOOL.

Report. — A very superior exhibit of beautifully washed merino combing wool, of the highest quality, and excellent in every respect; also, combing wool, of choice quality.

Alexander Wilson, Coree, New South Wales, Australia.

WOOL.

Report. — Fleeces of merino combing wool, of excellent growth and quality, and adapted for combing purposes; very choice in every respect.

W. Crozier, Adelaide, South Australia, Australia.

WOOL.

Report. — Merino ewe wool, of good staple, quality, and growth.

Samuel M. Caughey, Coonong, New South Wales, Australia.

WOOL.

Report. — One case of combing merino wool, of very superior quality and good staple ; also, beautifully washed.

Sir Samuel Wilson, Oakley Hall, Victoria, Australia.

MERINO WOOL.

Report. — Five bales of very fine merino wool, both ewe's and hogget's, remarkable for fineness of fibre and length of staple, admirably adapted for the manufacture of the finest cloths and cassimeres.

Marshall & Slade, Glengallan, Queensland, Australia.

MERINO WOOL.

Report. — A very creditable exhibit of merino wool, one fleece of which is from Champion ram. The wool is choice in every respect.

C. H. Green, Goomburra, Queensland, Australia.

MERINO WOOL.

Report. — Australian merino wool, of first-rate quality, and in excellent condition.

Ballarat Woollen Co., Ballarat, Victoria, Australia.

TWEEDS, SHAWLS, AND FLANNELS.

Report. — Tweeds, shawls, and flannels, of honest and substantial manufacture, at moderate cost, and good for general use.

Alexander Gray & Co., Albion Woollen Mills, Geelong, Victoria, Australia.

TWEEDS AND SHAWLS.

Report. — All-wool tweeds, in a handsome assortment of shawls and patterns, and of honest and substantial manufacture.

J. Vicars, Sydney, New South Wales, Australia.

TWEEDS, PLAIDS, AND SHAWLS.

Report. — Tweeds, plaids, and shawls, of honest and substantial manufacture, made of domestic wool, and very creditable for a new country.

AUSTRIA.

S. Trebitsch & Son, Vienna, Austria.

BLACK SILKS AND CRAVATS.

Report. — Black silks and silk cravats, well made, of good color and appearance, and, from their low price, adapted for a large consumption.

Karl Hetzer & Sons, Vienna, Austria.

SILK VELVETS.

Report. — Black and colored silk velvets, cotton back, made two pieces together, of good manufacture and excellent result.

C. G. Hornbostel & Co., Vienna, Austria.

SILKS AND SILK AND COTTON GOODS.

Report. — Fancy silks and mixed fabrics of good design and effect.

F. Reichert's Sons, Vienna, Austria.

SILK VELVETS AND SILK GOODS.

Report. — Colored and black velvets and silks, of excellent manufacture; specialty of white velvet of great purity.

First Hungarian Wool-Washing and Commission Co., Budapest, Austria.

WASHED WOOL.

Report. — Beautifully washed wool, from which potash is extracted from the yolk by an entirely new process.

J. J. Surber, Vienna, Austria.

REEDS AND HEDDLES FOR LOOMS.

Report. — A good collection of reeds and heddles for looms.

Albert Bauer, Humpoletz, Austria.

WOOLLEN GOODS.

Report. — A good collection of well-made cloth, at low prices, for general use.

Count Alvis Karolyi, Stampfen, Austria.

WOOL.

Report. — Several very beautiful fleeces of short wool, both washed and unwashed, of exceedingly fine quality and fibre, and adapted for the manufacture of superfine cloths.

Adolf Jacob Reichenberg, Bohemia, Austria.

WOOLLEN CLOTH.

Report. — A rich collection of military cloth, in good qualities and brilliant colors.

Count Emerich, Hungady Urmeny, Hungary, Austria.

HUNGARIAN WOOL.

Report. — Fleeces of washed and unwashed Hungarian wool, of excellent quality and fibre, and adapted to the manufacture of fine cloths.

Joint Stock Company of the Vöslau Worsted Yarn Manufactory,
Vöslau, Austria.

WORSTED YARNS.

Report. — An excellent collection of worsted yarns, of various numbers and brilliant colors.

Association of Cloth Makers, of Reichenburg, Bohemia, Austria.

CLOTHS, DOESKINS, AND TRICOTS.

Report. — A creditable assortment of broadcloths, doeskins, and tricots, of good quality, at cheap prices.

Otto von Bauer, Brunn, Austria.

FANCY CASSIMERES.

Report. — A very good collection of fancy cassimeres, of good finish, and neat designs, at moderate prices.

Emanuel Flieben, Vienna, Austria.

SHAWLS AND ROBES.

Report. — Well-made long shawls and morning robes in Oriental styles.

J. Philip Schmidt & Sons, Reichenberg, Bohemia, Austria.

BLACK AND COLORED CLOTHS.

Report. — Commended for excellent finish and material of black and blue broadcloths.

Hlawatsch & Isbary, Vienna, Austria.

SHAWLS.

Report. — Excellent shawls of fine material and good designs, in India styles.

Wilhelm Siegmund, Reichenberg, Bohemia, Austria.

BROADCLOTHS AND DOESKINS.

Report. — Commended for high excellence and finish, of superfine broadcloths and doeskins.

John Kemperling & Sons, Vienna, Austria.

CIGAR AND HATTERS' RIBBONS.

Report. — Silk, and silk and cotton, cigar and hatters' ribbons, of medium grade, in a great variety of colors and designs. The goods are very effective, and of good manufacture, both with regard to combination of materials and to their execution.

Gustav Schweinburg, Vienna, Austria.

CARPETS.

Report. — A good assortment of substantial carpets, for general use, at moderate prices.

Julius Schnabel, Oravitsa, Austria.

CARPETS.

Report. — A collection of Slavonic carpets, in original styles.

Ignatius Ginzkey, Maffersdorf, Bohemia, Austria.

BLANKETS AND CARPETS.

Report. — Blankets and carpets, distinguished for taste of design, beauty of dye and excellence of finish.

Willibald Schram, Vienna, Austria.

JACQUARD MACHINES.

Report. — Jacquard machines, excellent in workmanship.

BELGIUM.

J. H. Van Bellingen & Max Suremont, Antwerp, Belgium.

BLACK SILKS.

Report. — Commended for superiority of manufacture, fast colors, and splendid effects.

Th. J. Martin, Verviers, Belgium.

WOOL CARD CLOTHING.

Report. — An excellent exhibition of wool card clothing.

Felix Delrez, Verviers, Belgium.

WOOL CARD CLOTHING.

Report. — An excellent exhibition of wool card clothing.

Jacobs, Poelaert, & Co., Brussels, Belgium.

BLANKETS.

Report. — Commended for cheapness and adaptation of blankets to general consumption.

G. L. Lecloux, Dison, Belgium.

BROADCLOTHS.

Report. — Well made black and blue broadcloths, adapted to the clothing trade, at cheap prices.

Francois Biolley & Son, Verviers, Belgium.

BROADCLOTHS AND OVERCOATINGS.

Report. — Commended for excellence of manufacture and reasonableness of price, of broadcloth and overcoatings.

Domken Bros., Verviers, Belgium.

FANCY CASSIMERES AND WORSTED COATINGS.

Report. — Commended for cheapness, combined with utility, of fancy cassimeres and worsted coatings.

Charles Begasse, Liège, Belgium.

FELTS.

Report. — Well-made felts, at cheap prices.

Biolley Bros., & Co., Juslenville, Belgium.

FANCY CASSIMERES AND BATISTE CLOTHS.

Report. — Commended for excellent manufacture of fancy cassimeres and batiste cloth.

Jean Taste, Verviers, Belgium.

FANCY CASSIMERES AND MILITARY CLOTHS.

Report. — Commended for cheapness, combined with utility, of fancy cassimeres and military cloths.

M. Chatten & Co., Dison, Belgium.

BLACK AND COLORED CLOTHS AND BEAVERS.

Report. — Commended for good fabrication of black and blue cloths and Moscow beavers, at low prices.

J. J. Henrion, Dison, Belgium.

FANCY CASSIMERES.

Report. — Commended for good fabrication of fancy cassimeres, with neat designs, and at low prices.

Delhey Bros., Dison, Belgium.

CLOTHS.

Report. — Cloths, Moscows, and other beavers, adapted to popular consumption, at low prices.

Clement Bettonville, Hodimont, Belgium.

MOSCOW BEAVERS AND CLOTHS.

Report. — Commended for fair fabrication and cheapness of price of Moscows and other beavers.

H. J. Lejeune-Vincent, Dison, Belgium.

FANCY CASSIMERES.

Report. — Commended for novelty of design, excellence of manufacture, and adaptation to public wants, of fancy cassimeres.

Peltzer & Son, Verviers, Belgium.

COTHS AND DOESKINS.

Report. — Commended for excellent fabrication of broadcloths, doeskins, Moscow beavers, and chinchillas, at reasonable prices.

Iwan Limonis, Verviers, Belgium.

BROADCLOTHS, DOESKINS, AND BATISTE CLOTHS.

Report. — Commended for high excellence of manufacture of superfine black broadcloths and doeskins; excellence of batiste cloths.

H. & J. Drege, Dison, Belgium.

MOSCOW AND OTHER OVER-COATINGS.

Report. — Commended for good fabrication of Moscovs and other over-coatings, at cheap prices.

Braquenie Bros., Malines, Belgium.

TAPESTRY.

Report. — A rich collection of tapestries (Gobelins), of excellent workmanship and designs, of a very high artistic merit.

Hawzeur-Gerard, Sons, Verviers, Belgium.

YARNS.

Report. — Excellent carded yarns, in great variety and brilliancy of color.

Armand Jamme, Saint Hadelin, Belgium.

CARDED YARNS.

Report. — Well-spun carded yarns, of great variety of colors.

Société Houget et Teston, Bède & Co., Verviers, Belgium.

WOOL-PICKING AND CLEANING MACHINES.

Report. — Wool-picking and cleaning machine, condenser, card and fulling mill; all of excellent construction.

B R A Z I L.

Captain Luiz Ribiero de Souza Rezende, Rio Janeiro, Brazil.

RAW SILK AND COCOONS.

Report. — A variety of specimens of cocoons and raw silk, of great beauty and excellence, both as to the nature of the silk and its preparation, and meriting high commendation for the introduction of this important branch of industry.

Antonio Luiz dos Santos, Réis, Piratinim, Brazil.

RAW SILKS.

Report. — Commended for successful experiments in raw silk.

Du Nicolau J. Moreira, Rio de Janeiro, Brazil.

SILK COCOONS.

Report. — A highly curious specimen of a new silk-worm feeding on forest trees.

CANADA.

H. Winger, Elmira, Ontario, Canada.

FLANNELS.

Report. — Serge, flannel, cotton-wool blankets, excellent for the price.

Kell & Co., Bradford, England.

LASTINGS.

Report. — Lastings marked for their lustre and good texture.

Smith & Wilby, Toronto, Ontario, Canada.

FLANNELS.

Report. — Three quarters domestic flannels, at low cost, for general use.

John Wardlaw, Galt, Ontario, Canada

WOOLLEN YARNS.

Report. — White, colored, and gray knitting yarns, in considerable variety of shades; cheap, useful, and well adapted for general use.

Rosamond Woollen Co., Almonte, Ontario, Canada.

WOOLLENS.

Report. — Fancy cassimeres, and tweeds, of excellent manufacture and low cost.

Mills & Hutchinson, Montreal, Quebec, Canada.

WOOLLENS.

Report. — Three quarters cassimeres and Canadian tweeds, of excellent manufacture and good value.

Adam Lomas & Son, Sherbrooke, Quebec, Canada.

FLANNELS.

Report. — Very cheap flannels, cloths, and tweeds, well adapted for general consumption.

Samuel T. Willett, Chambly, Quebec, Canada.

FLANNELS.

Report. — Blue, scarlet, and mixed flannels, of rich color and soft texture, all excellent for the price.

John Harvey & Co., Hamilton, Ontario, Canada.

WOOL.

Report. — A very complete and creditable exhibit of Leicester, Cotswold, and Southdown wool; also, the following crosses: Leicester and merino, Leicester and Southdown, Cotswold and Leicester, Lincoln and Cotswold, Leicester and Cotswold. The Southdown and Leicester merino are excellent, both in staple and fibre; also, the Leicester and Southdown cross good; the others fair.

Toronto Tweed Co., Toronto, Canada.

WOOLLENS.

Report. — Fancy Scotch tweeds, plaids, and cheviots, in novel patterns, and at reasonable prices.

T. S. Fisher, Toronto, Ontario, Canada.

WOOLLENS.

Report. — Cheviot coatings, meltons, tweeds, and Blair Athols, all of useful manufacture and at low prices.



CHINA.

Hu Kwang Yung, Hang Chow, China.

PLAIN SILKS.

Report. — Plain colored satins of excellent manufacture and superior finish.

Fy Cheong, Canton, China.

FANCY AND PLAIN SILKS.

Report. — A very fine exhibit of colored and figured silk goods, showing marked improvements over former productions.

Imperial Maritime Customs, Shanghai, China.**PLAIN AND FANCY SILKS.**

Report. — A very fine collection of Chinese plain and fancy silks, highly meritorious for the improvement in the manipulation, workmanship, and uniformity; also an extraordinarily fine collection of raw silk, comprising a full assortment of all the qualities produced in the country.

**E G Y P T.****Estate of Bir-Abu, Bellach, Egypt.****SILK COCOONS.**

Report. — An exhibit of cocoons of great beauty and excellent nature of silk.

Giovanni Tramontina, Cairo, Egypt.**RAW SILK AND COCOONS.**

Report. — A fine exhibit of cocoons and specimens of raw silk of great regularity and tenacity, commendable especially on account of the difficulties of this new branch of industry.

His Highness the Bey of Tunis, Egypt.**SILK TISSUES AND MIXED FABRICS.**

Report. — A great variety of silk, silk and gold, and mixed fabrics of Tunisian manufacture, all evincing great taste and excellent workmanship, and highly commendable for the great care bestowed upon this collection.

The National Museum of Egypt, Cairo, Egypt.**FIGURED AND BROCADED SILKS.**

Report. — A splendid assortment and a great variety of national manufactures of silk and mixed fabrics, evincing great skill of workmanship and combination of colors, and meriting the highest praise for the good taste in which this collection has been made.

**F R A N C E.****Gondard, Cirlot, & Martel, Lyons, France.****FOULARDS.**

Report. — Commended for the elegance of design, brilliancy of colors, and general good taste of printed foulards.

Audibert, Monin, & Co., Lyons, France.

SILKS AND POPLINS.

Report. — Well made black Siciliennes of great regularity and beauty of texture.

Jandin & Duval, Lyons, France.

FOULARDS.

Report. — A great display of plain, figured, and printed foulards, elegant in design, taste, and execution.

J. P. Million & Servier, Lyons, France.

SILK GOODS AND VELVETS.

Report. — Commended for superiority of manufacture of black silk velvets and colored silk goods.

Alex. Giraud & Co., Lyons, France.

SILK GOODS.

Report. — Umbrella silks, of good color and manufacture.

Gillet & Son, Lyons, France.

DYED SILKS.

Report. — Fine assortment of black dyed silk, of superior shade and excellent workmanship; can scarcely be excelled.

Thomas Bro., Avignon, France.

RAW SILK.

Report. — Bright China tram and organzine, of very good quality and excellent preparation.

Jules Chabert & Co., Chomerac (Ardèche), France.

RAW SILK.

Report. — Commended for French tram of great regularity and remarkable elasticity; also for Bengal organzine of excellent preparation.

Louis Boudon, Saint-Jean-du-Gard, France.

RAW SILK.

Report. — A remarkable exhibition of white and yellow raw silk, of extraordinary fineness, purity, and great regularity.

Arlès-Dufour, Lyons, France.

RAW SILK.

Report. — A fine assortment of French raw silks of great beauty and China organzine of great regularity and neatness.

Jurie & Co., Lyons, France.

VELVETS AND SILKS.

Report. — A great variety of very well made black and colored plain silk velvets and dress silks.

Antoine Guinet & Co., Lyons, France.

BLACK SILKS.

Report. — Black silks, very effective in appearance, in low and medium grades.

J. Boquet & Co., Amiens, France.

SILK VELVETS.

Report. — Utrecht velvets in fine qualities and beautiful colors.

F. Thomas, Pont-des-Charrettes, France.

RAW SILKS.

Report. — A fine collection of cocoons and beautiful organzine, superior in every respect.

Font, Chambeyron, & Benoit, Lyons, France.

SILK VELVETS.

Report. — A fine assortment of black silk velvets, of great evenness and lustre; the blacks beautiful.

F. Brioude & Co., St. Étienne, France.

VELVET RIBBONS.

Report. — Black velvet ribbons, of good manufacture and finish, very well made in every respect.

Benoit, Tabard, & Co., Lyons, France.

LINING SILKS.

Report. — A good assortment of black and fancy lining silks, well made.

A. Hamelin Son, Paris, France.

SEWING SILK.

Report. — Sewing silk of excellent quality and manufacture; a great assortment of very fine shades.

Jaubert, Audras, & Co., Lyons, France.

BLACK SILKS.

Report. — Commended for excellence of manufacture and quality of material, and general superiority of black silks and satins.

Sevène, Barral, & Co., Lyons, France.

SILK GOODS.

Report. — A good display of medium qualities, fine shades, at reasonable prices.

Poncet, Senior & Junior, Lyons, France.

SILKS.

Report. — Commended for novelties in dress silks, of exquisite taste and perfect workmanship.

Faye & Thèvenin, Lyons, France.

COLORED SILK GOODS.

Report. — This exhibit has special merit in the superior manufacture of the plain silks, as regards quality and color.

C. J. Bonnet's Sons, Lyons, France.

BLACK SILKS.

Report. — Commended for unrivalled productions of black silk fabrics, showing the highest state of perfection in silk manufacture.

Huber & Co., Paris, France.

HATTERS' SILK PLUSHES.

Report. — Hatters' black silk plushes, of remarkable perfection in color and finish.

Gourd, Croisat Son, & Dubost, Lyons, France.

BLACK SILKS.

Report. — Commended for excellence in every respect of black silks, in medium and fine grades.

Gautier, Bellon, & Co., Lyons, France.

SILK VELVETS.

Report. — A fine exhibit of plain black and colored velvets; specialty of rich goods of superior manufacture.

Joseph Puydebard & Son, Lyons, France.

RAW AND SEWING SILKS.

Report. — Sewing silks, raw and dyed, of great regularity and excellent workmanship; specialty of saddlers' silk of great tenacity.

L. Dornon, Lyons, France.

SILK GAUZES FOR BOLTING CLOTH.

Report. — Commended for extraordinary fineness and great uniformity of texture.

Giron Brothers, St. Étienne, France.

VELVET RIBBON.

Report. — A great display of very well made velvet ribbons.

J. B. Martin, Tarare, France.

PLUSHES AND VELVETS.

Report. — Commended for superiority of manufacture, lustre, finish, and quality of black and colored plushes, for hatters and milliners.

Tapissier Son & Debry, Lyons, France.

BLACK SILK.

Report. — Commended for the great care and general excellence bestowed upon the manufacture in all its stages.

Mauvernay & Co., Lyons, France.

SILK GOODS.

Report. — Striped and fancy silks in medium grades, creditable for the price.

Bresson, Agnes, & Co., Lyons, France

SILKS.

Report. — A very fine exhibition of rich damask silks; also, novelties, in figure, crêpe du chène, and printed cravats.

C. J. Servant & Co., Lyons, France.

VELVETS AND SILKS.

Report. — Superior, very wide black silk velvets, of remarkable beauty, made of the best raw material of their own production.

L. R. Gascou, Montauban, France.

BOLTING SILK.

Report. — Silk bolting-cloth, of great regularity, perfect in execution.

Bardon & Ritton, Lyons, France.

SILKS.

Report. — A fine exhibit of colored faille and gros-grain, which, for superiority of manufacture, purity of material, brilliancy of color, and beauty of finish, cannot well be excelled.

Collective Exhibit of Chamber of Commerce of Reims, France.

COLLECTED EXHIBIT OF WOOLLEN MANUFACTURES.

Report. — A brilliant collection of merinos, cashmeres, satteens, reps, écosse cloth, plaid, white, and colored flannels, worsted coatings, fancy cassimeres, shawls, and blankets, all of high excellence. The finish of the merinos, and the variety and brilliancy of the colors, dyed by Delamotte and Ernst Houpin, are especially commendable.

Brosset, Heckel, & Co., Lyons, France.

SATINS.

Report. — All silk, and silk and cotton back, black and colored satins.

A. Prouvost & Co., Roubaix, France.

WOOLS.

Report. — A large assortment of prepared wools, from Australia, South America, Black Sea, Russia, France, and Belgium, also of slivers and noils from the same, adapted to a great variety of fabrics.

A. L. Trapadoux, Brothers, & Co., Lyons, France.

PRINTED FOULARDS.

Report. — A handsome collection of foulards.

Seydoux, Sieber & Co., Paris, France.

MERINO, CASHMERES, ROVINGS, AND YARNS.

Report. — Commended for a magnificent exhibit of French merinos, all wool, and silk warp cashmeres, gauzes, and debèges, all of the highest order of merit, in material, texture, beauty, and variety of hue and shade; also, for a complete collection of wool rovings and yarns, illustrative of the material of which the goods are composed.

E. Bellest & Co., Elbeuf, France.

BLACK AND COLORED CLOTHS.

Report. — A creditable exhibit of black and colored cloths, of medium grade.

Braquenie Brothers, Aubusson, France.

TAPESTRIES.

Report. — A rich collection of Gobelin tapestries, of excellent workmanship and design, and of a very high artistic merit.

Pin & Clenguet, Lyons, France.

SHAWLS.

Report. — Shawls, in India style, distinguished for beauty of design, harmony of color, and excellence of manufacture, and especially for the clearness of the whites.

Decaux & Son, Elbeuf, France.

MILITARY CLOTHS.

Report. — Well-made and serviceable military cloths, of good colors.

F. Vanoutrève & Co., Roubaix, France.

UPHOLSTERY GOODS.

Report. — Upholstery goods, reps, tapestries, and damasks, distinguished for beauty, excellence of fabrication, and variety of product.

J. Dabert & Co., St. Denis, France.

YARNS.

Report. — A large assortment of mélanges, in great variety of hues and shades, very evenly mixed.

Dumortie & Guigniet, Roubaix, France.

WORSTED SUITINGS.

Report. — Commended for variety of designs and excellence of manufacture in worsted suitings.

F. Talamon, Son, & Co., Paris and Elbeuf, France.

CLOTHS.

Report. — An admirable display of fancy cassimeres and worsted suitings, excellent in design and fabrication.

G. Maes, Clichy la Garenne, France.

DYED GOODS.

Report. — Commended for the vividness of color and variety of tints, in dyed cashmeres and upholstery goods.

F. Piquee & Brothers, Paris, France.

UPHOLSTERY.

Report. — Figured and plain Utrecht velvets, of excellent finish and colors.

Pinion & Guerin, Reims and Paris, France.

WOOLLEN DRESS GOODS.

Report. — Knickerbocker woollen dress goods, in great variety, and of excellent designs.

Ph. Dufourmantel & Co., Corbie Somme, France.

WOOLLEN YARNS AND YARNS OF WOOL AND SILK.

Report. — Woollen and silk and woollen yarns, of great perfection and wonderful fineness.

Poirrier, Mortier, & Müller, Paris, France.

DYED GOODS.

Report. — Commended for great variety and beauty of colors, in dyed cashmeres and merinos.

Montessuy & A. Chomer, Lyons, France.

CRAPES.

Report. — Goods perfect in manufacture, color, and finish, showing particularly great improvements in English crapes.

L. Droque & A. Monnard, Lyons, France.

POPLINS.

Report. — A fine assortment of plain, striped, and figured poplins, of brilliant shades, and good workmanship.

Chalamel & Co., Paris, France.

DYED GOODS.

Report. — Commended for brilliant and varied tints, in cashmeres and upholstery goods.

A. Guillaumet's Sons, Suresnes, France.

DYED GOODS.

Report. — Commended for beauty, variety, and vividness of tints in merinos, poplins, and reps.

E. de Montagnon & Son, Sedan, France.

CLOTHS.

Report. — Overcoatings and worsted suitings, of novel and elegant designs, and excellent quality.

Bertrand Boulla, Nîmes, France.

TAPESTRY.

Report. — Woven tapestry, in the imitation of the style of the middle ages, of high merit, and at low prices.

Robert Guérin's Widow & Son, Reims, France.

MERINOS, CASHMERES, AND REPS.

Report. — Merinos, cashmeres, and reps, of excellent manufacture.

Manufacture Nationale de Gobelins, Paris, France.

GOBELINS.

Report. — Splendid specimens of gobelin tapestry, representing this celebrated establishment.

National Tapestry Manufacture of Beauvais, Beauvais, France.

TAPESTRY.

Report. — Very fine specimens of artistically woven tapestry, perfect in design, combination of colors, and general execution.

Tresons & Lecerq, Amiens, France.**CHEMICAL PROCESS FOR REMOVING FIBRES FROM WOOLLENS.**

Report. — An interesting exhibit of cloths, illustrating a chemical process for removing fibres of burrs, thistles, and vegetable particles from woollen fabrics, the samples showing extraordinary efficiency in the process employed, and indicating a discovery of great practical value.

E. Roussel, Roubaix, France.**DYED STUFFS.**

Report. — A very fine collection of piece-dyed woollens, perfect in shade and finish.

L. Dupont, Beauvais, France.**UPHOLSTERIES AND AXMINSTER CARPETS.**

Report. — Commended for excellence and originality of designs in tapestry and upholstery fabrics; also, Axminster carpets, of superior quality and beautiful design.

Clement Gravier, Nîmes, France.**CARPETS.**

Report. — Commended for excellence of design and execution of carpets.

Arnaud Guedan & Co., Nîmes, France.**AXMINSTER CARPETS.**

Report. — Axminster carpets, of finest quality and beautiful designs.

GERMANY.**Woldemar Wimmer, Annaberg, Germany.****GOLD AND SILVER BRAIDS.**

Report. — A very creditable assortment of silk and gold braids and galloons.

Escales & Hatry, Saargemund, Germany,**BLACK SILK PLUSHERS.**

Report. — Hatters' black silk plushes of remarkable perfection in color and finish.

Gressard & Co., Hilden, Germany.

SILK FOULARDS.

Report. — A superb assortment of well-finished foulards and handkerchiefs.

Carl Metz & Sons, Freiberg in Baden, Germany.

SEWING SILK.

Report. — An assortment of colored and black sewing silk of great brilliancy in color and finish.

Heinr. Lewald, Breslau, Germany.

WOOL.

Report. — A good exhibit of woollen and vigogne fabrics, made for technical and medical purposes.

Ambros Marthaus, Oschatz, Germany.

FELTS.

Report. — Perfectly made felts, used for saddle cloths, shoes, and boots.

R. von Meus, Karlsdorf, Silesia, Germany.

SILESIA WOL.

Report. — Three very fine fleeces of Silesian wool, of excellent quality and fibre, and adapted for the manufacture of the finest cloths produced.

Valckenberg & Shoen, Worms, Germany.

ARTIFICIAL WOOL.

Report. — A good assortment of extract, — mungo and shoddy wool.

Joint Exhibition of Elberfeld Manufacturers of Zanella and Coatings, Elberfeld, Germany.

ITALIAN CLOTHS.

Report. — A splendid exhibition of Italian cloths and coatings, plain and figured, of excellent qualities, fine color, and perfect finish.

Leop. Ph. Hemmer, Aix-la-Chapelle, Germany.

FULLING MILL.

Report. — A model of fulling mill of excellent construction.

Benthner Bros., Berlin, Germany.

CARD CLOTHING.

Report. — A good assortment of card clothing.

L. & E. Lairtz, Remda, Germany.

VEGETABLE WOOL.

Report. — A fine exhibit of vegetable wool and manufactures thereof, very well made in every respect.

W. S. Spindler, Berlin, Germany.

DYED AND PRINTED WORSTED YARNS.

Report. — A rich collection of dyed and printed worsted yarns in brilliant colors and perfect shades.

Ackens, Grand, Ry, & Co., Eupen, Germany.

CLOTHS.

Report. — Commended for brilliancy and stability of colors, good quality, and cheapness of their woollen cloths.

C. Delius, Aix-la-Chapelle, Germany.

CLOTHS AND COATINGS.

Report. — Commended for his large production of well-made fancy coatings, at moderate prices.

Alois Knaps, Aix-la-Chapelle, Germany.

BLACK AND COLORED CLOTH.

Report. — Carefully and solidly manufactured black and colored cloths and coatings, at moderate prices.

Joh. Wilh. Jansen, Montjoie, Germany.

FANCY CASSIMERES AND COATINGS.

Report. — Excellent fancy cassimeres and overcoatings, produced in elegant styles, fine qualities, and finish.

Wiese Bros., Werden on the Ruhr, Germany.

CLOTH.

Report. — Cloths and overcoatings, distinguished by superiority of material and excellence of manufacture and finish.

I. P. Schöller, Dühren, Germany.

CLOTHS AND COATINGS.

Report.— Fine cloths and coatings, made of the best wools, with perfect finish.

Joh. Erkens Sons, Burtscheid, Germany.

BLACK AND COLORED CLOTHS AND OVERCOATINGS.

Report.— Commended for fineness and finish of doeskins, and for brilliancy of colors and finish of military cloths.

L. Schöller & Sons, Dühren, Germany.

CLOTHS AND COATINGS.

Report.— A rich assortment of cloths and worsted coatings, in the best qualities and highest finish.

Massing Brothers & Co., Puttlingen, Germany.

BLACK SILK PLUSHES.

Report.— A remarkable assortment of hatters' black silk plushes, of great beauty in color and finish.

Paul Scholz, Friedberg, Germany.

WOOLLEN STOCKINGS.

Report.— An exhibit of woollen felted stockings, commendable for their good execution and great durability.

Bergmann & Co., Berlin, Germany.

DYED ZEPHYR WOOL.

Report.— Commended for the brilliancy of colors, perfection and variety of shadings of their Berlin wools.

Heinrich Hüffer, Crimmitschau, Germany.

VIGOGNE YARNS.

Report.— Commended for the good assortment, large production, and cheapness of his vigogne yarns.

Wurtemberg Wool Felt Co., Giongen, Germany.

FELTS.

Report.— A rich collection of wool felts in great perfection.

Tittel & Krüger, Leipsic, Germany.

DYED WORSTED YARNS.

Report. — Well-dyed worsted yarns, in brilliant colors.

Worsted Yarn Co., Kaiserslautern, Germany.

WORSTED YARNS.

Report. — Commended for large production of fine worsted yarns for weaving purposes, in great variety of qualities, colors, and mixture.

Gevers & Schmidt, Schmiedberg, Germany.

SMYRNA CARPETS.

Report. — A rich assortment of imitations of Smyrna carpets, of superior quality and tasteful Turkish styles.

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GREAT BRITAIN.
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Wm. Bliss & Son, Chipping Norton, Oxfordshire, England.

WOOLLENS.

Report. — Commended for a very handsome assortment of Himalayan shawls, novel in pattern and combination; also, for tweeds, Cots-wold suitings, serges for military wear, Cambridge rugs, Angora beavers, and horse clothing, all of excellent manufacture, and adapted for general use.

Howgate, Day, & Nolt, Huddersfield, England.

WOOLLENS.

Report. — A very complete assortment of reversible coatings, Victoria naps, Irish frieze, and president's cloth, all of excellent manufacture, at low prices.

Pim, Brothers, & Co., Dublin, Ireland.

SILK AND WOVEN POPLINS.

Report. — Black and colored hand-woven plain silk poplins, excellent in every respect; furniture damasks of superior effect and manufacture.

Ch. A. Rickards, Leeds, England.

SEWING SILK.

Report. — Sewing silk of excellent character, both as to quality, color, and preparation.

Sheldon & Fenton, London, England.

SEWING SILKS.

Report. — Sewing silks of excellent quality, and of brilliant colors, in a variety of shades.

Wm. Milner & Sons, Leek, Staffordshire, England.

SEWING SILKS.

Report. — Sewing silks of excellent appearance for the prices quoted.

India Museum, Kensington, London, England.

SILKS AND MIXED FABRICS.

Report. — A splendid display of India productions of silk and mixed fabrics of classical taste and beauty.

The Mill Hill Wool and Rag Extracting Co. (Limited), Huddersfield, England.

PREPARED SHODDY AND WOOL.

Report. — Commended for shoddy and wool, prepared for manufacturing purposes, by a patent process, by which the burrs are completely cleaned, and for cotton and wool stuff, prepared on the same principle.

David Smith & Co. (Limited), Halifax, England.

PREPARED SHODDY AND WOOL.

Report. — Commended for shoddy and wool, prepared by a patent process, by which the burrs are completely cleaned, and for cotton and wool stuff, prepared on the same principle, for manufacturing purposes.

James Oddy & Son, Bradford, England.

WOOLS.

Report. — An unique assortment of fleeces, admirably illustrative of the principal characteristic wools of England.

Stanfield, Brown, & Co., England.

SHOE LASTINGS.

Report. — A superb exhibit of ten numbers of lastings, especially creditable for richness of lustre, good color, and evenness of thread.

John L. Bowes & Bro., Liverpool, England.

WOOLS, MOHAIRS, ALPACAS, NOILS, AND WASTE.

Report.—Commended for a very complete and well arranged assortment of wool, mohair, and alpaca, comprising about two hundred and eighty specimens, from all parts of the world; also, for wool waste, extract wool, silk noils, camel's hair noils, alpaca, and mohair noils, mungo, and wool waste, adapted for manufacturing purposes.

Pryce Jones, Newtown, North Wales, Great Britain.

FLANNELS.

Report.—A creditable exhibit of white Welsh, colored, striped, and robe flannels, together with mixed shawls of substantial make.

Titus Caverley & Sons, Huddersfield, England.

DOESKINS AND CASSIMERES.

Report.—Commended for economy and cost in the manufacture of black doeskins and Union cassimeres, which are really creditable articles at the price.

Edward Webb & Sons, Worcester, England.

HAIR CLOTH.

Report.—Hair cloth, adapted to upholstery and tailors' padding. The former specially notable for beauty and novelty of effects, in pure white grounds, with rich, dark-colored stripes, in various shades; the fabric adapted to warm climates.

Robert S. Davies & Sons, Stonehouse Mills, Gloucestershire, England.

CLOTHS, BEAVERS, MELTONS, AND DOESKINS.

Report.—A very creditable exhibit of superfine cloths, beavers, meltons, and doeskins, of excellent manufacture, color, and finish.

Robert Brearley & Son, Great Britain.

PILOTS, BEAVERS, AND OVERCOATINGS.

Report.—A very creditable exhibit of pilots, beavers, and overcoatings, at moderate cost and adapted for general consumption.

James Aked & Sons, Halifax, England.

WORSTED COATINGS.

Report.—Worsted coatings, of excellent manufacture, and at low prices.

J. E. & G. F. Buckley, Delph, near Manchester, England.

SHAWLS.

Report. — A small assortment of shawls, in creditable styles, and at very low cost.

Isaac Carr & Co., Bath, England.

MELTONS, BEAVERS, AND OVERCOATINGS.

Report. — Meltons, beavers, and overcoatings, of superior manufacture and finish, at moderate cost.

Thackray & Co., Leeds, England.

CALF'S HAIR COATINGS.

Report. — A very handsome assortment of calf's hair coatings, in beautiful shades, and of excellent manufacture.

Ainley, Lord, & Co., Huddersfield, England.

WORSTED COATINGS.

Report. — Well-made worsted coatings, of good quality.

Jesse Clegg, Huddersfield, England.

COTTON-WARP FANCY CHEVIOTS.

Report. — Commended for economy and cost in the manufacture of cotton-warp fancy cheviots, of considerable merit, and adaptation for general use.

Liddle & Brearley, Huddersfield, England.

WORSTED COATINGS.

Report. — A very creditable exhibit of worsted coatings, in neat designs, well manufactured, and adapted for general use.

Starkey Brothers, Huddersfield, England.

BEAVERS AND DOESKINS.

Report. — Beavers, venetians, doeskins, and woaded cloths, of excellent manufacture, color, and finish.

William King, Morley, Leeds, England.

COTTON WARP CLOTHS.

Report. — Commended for economy and cost of cotton warp cloths, of excellent make and finish.

Charles Hooper & Co., Stonehouse, Gloucestershire, England.

CLOTHS, BEAVERS, AND DOESKINS.

Report. — An excellent assortment of black and blue superfine cloths; scarlet, crimson, and other fine military cloths, of brilliant and permanent colors; kerseys, of close and fine texture; Hoopers' web, a specialty of the house; elysians, beavers, and doeskins; all of a high order of merit, and comprising an unusual variety for one manufactory.

Thomas Mallinson & Sons, Huddersfield, England.

FANCY CHEVIOTS.

Report. — A small assortment of fancy cheviots, of superior manufacture, at low prices, and adapted for general consumption.

Marling & Co., Stroud, England.

CLOTHS AND BEAVERS.

Report. — An excellent assortment of superfine cloths, beavers, doeskins, and cassimeres, of superior merit, and of permanent colors and finish.

Samuel Salte & Co., Trowbridge, Wilts, England.

FANCY CASSIMERES.

Report. — A very handsome assortment of fancy cassimeres in novel styles, and at moderate prices.

John Day & Son, Huddersfield, England.

CHEVIOT COATINGS.

Report. — Cheviot coatings of excellent manufacture, at small cost, and adapted for general use.

Joseph Buckley & Co., Delph, near Manchester, England.

COTTON AND WOOL SHAWLS.

Report. — Cotton and wool shawls, in tasteful patterns and combinations, at low cost.

John Taylor & Sons, Great Britain.

WORSTED COATINGS AND SILK AND WOOL CASSIMERES.

Report. — Worsted coatings, and fancy cassimeres of silk and wool, of excellent manufacture and neat patterns.

Hargreave & Nusseys, Leeds, England.

WORSTED COATINGS.

Report. — Worsted coatings, medium cloths, tweeds and meltons, all of superior quality, excellent manufacture, and at low prices.

T. W. Little & Co., Leeds, England.

UNION CLOTHS.

Report. — Mixed union cloths, bird's eye, and tweeds, at low cost, adapted for general consumption.

William Child, Huddersfield, England.

MOHAIR SEALSKINS.

Report. — A very fine exhibit of mohair sealskins, tipped seals, and dogskins, of exceedingly fine quality, rich material and finish, all of the highest order of merit.

M. Mahoney & Brothers, Cork, Ireland.

BLARNEY TWEEDS.

Report. — A complete assortment of Blarney tweeds, in a great variety of colors, patterns, and qualities, all of a high order of merit, and most useful goods for general consumption.

Henry Andrews & Co., Leeds, England.

COATINGS AND COTTON WARP.

Report. — Worsted coatings, cotton warp, melton, and water-proof, of excellent manufacture, and at low cost.

J. D. Birchall & Co., Leeds, England.

TWEEDS AND COATINGS.

Report. — A very complete assortment of light tweeds, of beautiful colors and texture; also, worsted coatings, meltons, and beavers, all of superior merit, at moderate cost, and adapted for general use.

B. Hepworth & Sons, Dewsbury, England.

LAP ROBES AND RUGS.

Report. — Lap robes and rugs, in great variety of pattern and of excellent manufacture; also, ingenuity of process of shearing rugs, so as to produce an imitation of an animal's skin.

Norris & Co., London, England.**UPHOLSTERY GOODS.**

Report. — A fine display of upholstery silks, of good styles, and well manufactured.

Tomkinson & Adam, Kidderminster, England.**CARPETS.**

Report. — A fine collection of Axminster carpets, in beautiful qualities and magnificent design.

Henderson & Co., Durham, England.**AXMINSTER CARPETS.**

Report. — A fine and rich assortment of Axminster carpets, of admirable designs and qualities.

John Crossley & Sons (Limited), Halifax, England.**CARPETS.**

Report. — A large collection of tapestry, Brussels, and velvet and Wilton carpets, in superior qualities and at moderate prices.

John Lewis, Halifax, England.**CARPETS.**

Report. — A collection of Brussels and Wilton carpets, of best qualities, and exquisite styles.

J. & J. S. Templeton, Glasgow, Scotland.**CARPETS.**

Report. — Commended for a rich variety of Wilton and Brussels carpets, in admirable designs and superior qualities, and especially for patent brocade curtains, silk and wool, in the most elegant designs and combination of colors.

James Templeton & Co., Glasgow, Scotland.**CARPETS.**

Report. — A superior assortment of Axminster carpets, in exquisite styles, best of quality.

Thomas Stevens, Coventry, England.**SILK LOOM AND SILK FIGURED RIBBONS.**

Report. — Silk loom, of excellent and quite original construction, design, and quality; result excellent and economical; new and excellent plan to lessen the pressure of the cards in the Jacquard machine.

The large variety of figured and emblematical silk ribbons evince the highest perfection.

Nussey & Leachman, Leeds, England.

CLOTH MACHINE.

Report. — A powerful hot pressing machine, for cloth, having an effective and automatic action.

Greenwood & Batley, Leeds, England.

WARP-TYING MACHINES.

Report. — A warp-tying machine of very ingenious construction.

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I T A L Y .

M. G. Diena, fu Jacob, Spilimberto, near Modena, Italy.

SILK COCOONS AND RAW SILK.

Report. — A very fine exhibit of cocoons, also, very elastic and clear grèges of great beauty.

E. Meyer & Co., Milan, Italy.

RAW SILK.

Report. — Raw and thrown silks, of remarkable quality, both as to regularity, purity, and elasticity.

Filippi dalla Pozza, Vicenza, Italy.

RAW SILK.

Report. — Very fine and well spun raw silk, very clean, and of great tenacity and elasticity.

Ugolino Chiericoni, Messina, Italy.

SILK COCOONS.

Report. — Silk cocoons of great beauty and superb quality.

Leopoldo Cagliani, Milan, Italy.

SILK VELVETS.

Report. — Silk colored velvets, of good color and very creditable manufacture.

Alberto Keller, Milan, Italy.

RAW SILK.

Report. — Raw silk of great superiority in every respect.

Erede Saloman Sinigaglia and Lattes, Turin, Italy.

RAW SILK.

Report. — An excellent show of raw silk, of remarkable purity, perfect in preparation.

Carlo Ditta Morandi, Milan, Italy.

SILK TASSELS AND FURNITURE GALLOONS.

Report. — Very well made silk tassels and furniture galloons.

Enrico Beati, Milan, Italy.

SILK STOCKINGS.

Report. — A good variety of plain and fancy silk stockings.

Giov. Bozzalla & Brother, Biella, Italy.

CASSIMERES.

Report. — A creditable exhibit of fancy cassimeres, in good designs and at moderate prices.

Antonio Bozzalla & Brother, Coggiola, Italy.

CASSIMERES.

Report. — A creditable exhibit of fancy cassimeres, in good designs, at moderate prices.



J A P A N .

Y. Tamamura, Ishi-i-mura, Shimodzu, Japan.

RAW SILK.

Report. — Very good specimens of raw silk, of excellent quality, carefully prepared.

M. Marunaka, Kanazawa, Kaga, Japan.

RAW SILK.

Report. — Very superior raw silk.

Yo. Suzaki, Yamura, Kai, Japan.

PLAIN SILKS.

Report. — Plain, colored, and checked silks, well-woven, and of good appearance.

Yamamoto Kinu, Susakamura, Shinano, Japan.

SILKS.

Report. — Two productions of silks made from the cocoons of new silk-worms, feeding on the native walnut; highly interesting.

Y. Nakagawa, Kiyoto, Japan.

SILK CRAPES.

Report. — Excellent specimens of white silk crapes, perfect in color, and of great solidity.

S. Nishimura, Kiyoto, Japan.

SILK CRAPES.

Report. — Dyed and printed silk crapes, excellent in color and execution, principally the shaded specimens.

Y. Shibata, Hakata, Chikusen, Japan.

SILK GOODS.

Report. — Silks for ladies' scarfs, of perfect manufacture.

S. Tomita, Kyoto, Japan.

GAUZES.

Report. — Well-made silk gauzes, commendable for their low price.

H. Kono, Chikuma, Kew, Japan.

SILKS.

Report. — Samples of silk, natural color, from the silk of the worm feeding on the oak; new and very remarkable.

Collective Exhibition of the Weavers of Mineyama, Province of Tango, Japan.

SILK CRAPES.

Report. — A very fine assortment of white and colored silk crapes, showing great perfection, principally those marked "Ikebe."

Government Establishment for Experimental Silk-Worm Breeding, Tokio, Japan.

RAW SILK AND COCOONS.

Report. — An excellent exhibit of raw silk, and cocoons, of great regularity, evenness, and tenacity, showing the best productions of this valuable industry, collected from the silk-spinning establishments of Tomioka, Yamanacho, Nihoumato, Kanasawa, and Nagano.

Local Government of Tsurugaken, Japan.**PLAIN FOULARD SILK.**

Report. — White foulard, excellent in quality, at a remarkably low price.

Government Office for Experimental Silk-Worm Breeding, Tokio, Japan.

SILK-WORM BREEDING.

Report. — A very fine exhibit, showing the breeding of the silk-worm, with drawings, models, samples, implements, &c., showing great care in its preparation.

The Nishijin Weavers, Kiyoto, Japan.

BROCADED SILKS.

Report. — An excellent show of rich brocade silks, of good designs, and combinations of colors.

The Kanokoshosha Co., Kiyoto, Japan.

DYED CRAPES.

Report. — Commended for excellent production of tie and dye (Kano) crapes.

Collective Exhibition of Weavers, from Nagahama, Province of Omi, Japan.

WHITE CRAPES.

Report. — A very fine assortment of white silk crapes, showing great clearness in color and regularity in texture, particularly those marked "Nishigori."

NETHERLANDS.

Collective Exhibition of Woollen Manufacturers, Tilburg, Netherlands.

BLANKETS AND FLANNELS.

Report. — A large collection of blankets, white and colored flannels, fancy cassimeres, beavers, and kerseys, in creditable qualities, and at low prices.

Ministry of the Colonies, The Hague, Netherlands.

GOLD EMBROIDERY STUFFS.

Report. — A splendid collection of silk and Oriental tissues, superb in design, and perfect in workmanship, highly meritorious for the great care bestowed on this exhibit.

A. G. Garjeanne & Co., Delft, Netherlands.

CARPETS.

Report. — Imitations of Smyrna carpets, of good qualities and taste.

Jan Henkensfeldt, Delft, Netherlands.

CARPETS.

Report. — Imitations of Smyrna carpets, of good qualities.

Royal Carpet Manufactory, Deventer, Netherlands.

CARPETS.

Report. — A fine collection of imitations of Smyrna carpets, in tasteful designs.



NEW BRUNSWICK.

J. Q. Woodworth, St. John, N. B.

WOOLLEN YARNS.

Report. — A considerable variety of woollen yarns, in good colors and well adapted for the purpose intended.

S. H. Powers, Woodstock, N. B.

HAND LOOM.

Report. — Useful hand loom for domestic purposes.



NEW SOUTH WALES.

George Torne, Sydney, New South Wales,

SILK COCOONS.

Report. — A good assortment of cocoons of different races; commendable, considering the youth of the plantation.

J. M. May, Sydney, New South Wales.

SILK COCOONS.

Report. — A fine show of cocoons. Very creditable as first essays.

NEW ZEALAND.

W. S. Peter, Canterbury, New Zealand.

WOOL.

Report. — Merino fleece wool, of very choice quality, good fibre, and staple.

Samuel Bealey, Canterbury, New Zealand.

WOOL.

Report. — Several fleeces cross-merino ewe wool, by Romney Marsh or Kent ram, of very choice quality and good weight.

John Hall, Canterbury, New Zealand.

WOOL.

Report. — Merino fleece wool, of very superior quality and growth.

Geo. A. Anstey, Nelson, New Zealand.

WOOL.

Report. — Several fleeces of merino ram and ewe wool, of choice quality and excellent growth.

J. Cathcart Wason, Canterbury, New Zealand.

WOOL.

Report. — Commended for several fleeces of merino wether wool, and for Lincoln fleeces, of good staple and quality.

A. Braithwaite, Wellington, New Zealand.

WOOL.

Report. — Romney Marsh and merino fleece wool, of good quality and growth.

A. H. Riekman, Canterbury, New Zealand.

WOOL.

Report. — Romney Marsh ewe wool, very silky and of healthy growth.

NORWAY.

Guneris Pettersen, Christiania, Norway.

FLANNELS AND WOOLLEN DRESS GOODS.

Report. — Well-made dress goods and flannels, for general consumption.

NOVA SCOTIA.

Oxford Woollen Mills, Oxford, N. S.

WOOLLENS.

Report. — Wool flannels, Halifax tweeds, and homespun stuff, all excellent goods for general use.

PORTUGAL.

David José da Silva & Son, Oporto, Portugal.

DAMASK OF SILK AND GOLD.

Report. — Gold and silver damasks, for church purposes and upholstery, of good design and excellent manufacture.

Viuva Ferreira Campos & Co., Oporto, Portugal.

GOLD BROCADES AND MILITARY TRIMMINGS.

Report. — Gold brocades and silk and silver cloth, in good taste and of excellent manufacture; gold and silver military trimmings in great variety and well made.

Jacintho P. Valverde.—Miranda Vasconcellos, Oporto, Portugal.

RAW SILK.

Report. — Raw silk of excellent quality in every respect.

F. Cabral Paes & Sons, Vizeu, Portugal.

RAW SILK AND COCOONS.

Report. — Very fine silk cocoons and silk spun thereof; quality and preparation highly commendable.

José Antonia Reis, Moncorvo, Bragança, Portugal.

RAW SILK.

Report. — Raw silk of great fineness, excellent spinning, and general effect.

Simão Ribas, Guarda, Portugal.

RAW SILK.

Report. — A fine exhibit of very well spun tram, of great pureness and tenacity.

Antonia de Sa. Pereira, Sta. Maria, Bragança, Portugal.

RAW SILK.

Report. — Raw silk of excellent quality, as to the natural tenacity and of very regular preparation.

National Silk Spinning and Weaving Co., Lisbon, Portugal.

RAW COCOONS AND SILK UPHOLSTERY GOODS.

Report. — A very fine show of silk cocoons, also raw silk of excellent quality, and silk upholstery goods of good manufacture and excellent design.

The Central Commission of the District of Vizeu, Vizeu, Portugal.

SILK COCOONS.

Report. — A very fine exhibition of raw silk cocoons of superior quality.

Egyptian Raw Silk Co., Oporto, Portugal.

RAW SILK.

Report. — Very clean, strong, and elastic raw silks and sewing silks.

Portalegre Woollen Manufacturing Co., Portalegre, Portugal.

FANCY CASSIMERES.

Report. — A collection of fancy cassimeres in creditable qualities and good designs.

Bernardo Daupias & Co., Lisbon, Portugal.

CASSIMERES, PONCHAS, AND SHAWLS.

Report. — A creditable assortment of fancy cassimeres, ponchas, and woollen shawls.

Constant Burnay, Lisbon, Portugal.

CASSIMERES, FLANNELS, AND BLANKETS.

Report. — A very creditable exhibition of fancy cassimeres, flannels and blankets.

Antonio Alves, Bibiano, Pedrogao Grande, Portugal.

BLACK CLOTHS.

Report. — Black cloths in creditable qualities and low prices.

Campo Grande Woollen Fabrics Co., Lisbon, Portugal.

CLOTHS AND SHAWLS.

Report. — A good assortment of black and blue cloths and shawls.

Custodio Lopes da Silva Guimaraes, Penafiel, Portugal.

GOLD AND SILVER GALLOONS AND GIMP.

Report. — A good assortment and well-made gold and silver galloons and gimp.

Ramires & Ramires, Lisbon, Portugal.

COLORS SILKS, VESTINGS, AND RICH BROCATELLES.

Report. — Black and colored failles of excellent manufacture in every respect; rich brocatelles of good design and execution.

PROVINCES OF THE OTTOMAN EMPIRE.

Collective Exhibit of Raw Silk Cocoons from the Provinces of the Ottoman Empire.

RAW SILK AND COCOONS.

Report. — An excellent display of silk cocoons and raw silk, of exceptional merit.

R U S S I A.

Ibrahim Bogdanof Teregoulouf, Tiflis, Russia.

SILK COCOONS.

Report. — A variety of silk cocoons, principally of new races, showing great care, and worthy of commendation for successful efforts in introducing this new branch of industry.

Emelianof & Rochefort, Moscow, Russia.

SILK AND WOOL DRESS GOODS.

Report. — A fine assortment of fancy dress goods, silk and wool, in rich qualities and tasteful combinations.

Zolotaref & Ribakof, Moscow, Russia.

WORSTED AND SILK DRESS GOODS.

Report. — A great variety of fancy dress goods of worsted and silk, in very tasteful styles and at moderate prices.

A. & W. Sapojnikof, Moscow, Russia.

DAMASKS OF SILK AND SILVER AND GOLD.

Report. — A superb display of the richest silk and gold and silver brocades, unrivalled in every respect.

Sergius Zoobkof, Khomootovo, Moscow, Russia.

PLAIN SILKS.

Report. — Colored failles of rich quality, excellent material, and great brilliancy; high degree of merit.

Alexis Fomitchef, Moscow, Russia.

SILKS.

Report. — Rich figured failles and silk cashmeres of great beauty and taste.

Pokrovsky Sisterhood of Charity, Moscow, Russia.

SILK COCOONS.

Report. — A good display of silk cocoons of fine quality.

Kondrashef Brothers, Grebenevo, Moscow, Russia.

SILK GOODS.

Report. — Commended for plain black and colored failles, excellent in color and manufacture, also for very well made upholstery damasks.

Brashnin Bros., Oriechovo-Zooevo, Moscow, Russia.

SILK GOODS.

Report. — A creditable assortment of striped and checkered dress silks.

Russian Government.**RAW SILK AND SILK COCOONS.**

Report. — A very fine display of raw silk and silk cocoons in great variety, all of excellent quality and purity, meriting high commendation and showing great skill and care on the part of the Director, Mr. Lootchinsky.

Peter Kozishnikof, Veliki, Oostioog, Valogda, Russia.

BRISTLES.

Report. — Commended for bristles of extraordinary length, adapted for the manufacture of brushes.

Marinska Model Farm, near Saratov, Russia.

WOOL.

Report. — An exhibit of excellent merino clothing wool, with samples illustrative of native Russian merino fleeces.

Count Komarowsky, Government and District of Orel, Russia.

WOOL.

Report. — Six illustrative fleeces of wool of native Russian breeds and English races.

Theodore Fatz, Olviopol, Kherson, Russia.

WOOL.

Report. — Samples of Electoral wool of great fineness and beauty.

V. Labenski, Government and District of Warsaw, Russia.

WOOL.

Report. — Two cases of very beautiful Electoral wools, short and fine in staple, corresponding to the fine Silesian and Hungarian wools.

Gaueshin & Bros., Moscow, Russia.

WOOL.

Report. — Merino wool, washed, fine and of good staple.

Nicholas Glinka, Ostrolenka, Louiza, Russia.

WOOL.

Report. — Four fleeces of clothing wool from sheep of the Electoral breed, of special fineness.

Boklauof & Sons, Moscow, Russia.

WOOL.

Report. — Six small bales of excellent washed merino wool.

Edward Falz-Fein, Kakhovka, Tanvide, Russia.

WOOL.

Report. — Commended for seven fleeces of washed merino wool, of fine quality and good growth; and for one hundred samples of clothing and combed merino wool of great excellence.

P. Mariolaki, Rostov on the Don, Russia.

WOOL.

Report. — Excellent Donskoi wool, marked for cleanness and length of staple.

A. Warshawski, St. Petersburg, Russia.

WOOL.

Report. — Samples of wool of Rambouillet and Negretti breeds, of good growth, quality, and staple.

Karlovka-Estate of the Grand Duchess Katherine Mikhailoona, Government of Poltava, Russia.

WOOL.

Report. — One hundred samples of wool from sheep of the Rambouillet and Negretti breeds, principally adapted for combing purposes and remarkable for length of staple.

E. Gootchkof, Moscow, Russia.

CASSIMERES, CLOTHS, AND SHAWLS.

Report. — Very creditable fancy cassimeres (black and colored), cloths, and woollen shawls.

Baron Stieglitz, near Narva, Russia.

CLOTHS AND BEAVERS.

Report. — Broadcloths, black and colored beavers and Moscows, of excellent qualities and finish.

Nikitin Gorjaef & Co., Moscow, Russia.

DRESS GOODS AND BAREGES.

Report. — Fancy dress goods, gauzes, and bareges, of wool and silk, in elegant styles.

E. Armand & Sons, Moscow, Russia.

ALPACAS AND LUSTRES.

Report. — Merinos, figured alpacas, black and colored lustres, in good qualities, and brilliant colors.

Theodore Mikhailof & Son, Moscow, Russia.

SERGES, REPS, AND ALPACAS.

Report. — A fair collection of fancy dress goods, serges, reps, and black and colored alpacas.

G. Kommichau, Belostok, Grodno, Russia.

BLANKETS AND RUGS.

Report. — Woollen goods, blankets, and rugs in creditable qualities.

A. Shrader, Moscow, Russia.

LUSTRES, CASHMERES, AND PLAIDS.

Report. — A rich assortment of black and colored lustres, cashmeres, and plaids, in good qualities and colors.

Gaueshin & Co., Moscow, Russia.

WORSTED YARNS, MOHAIRS, AND ALPACAS.

Report. — A good assortment of single and twisted worsted yarns, mohairs, and alpacas.

G. P. Uskof, Moscow, Russia.

FANCY DRESS GOODS.

Report. — Fancy dress goods, Lyons, and plaids, in good qualities and designs.

Nicholas Seliverstof, Roomiantzevo, Smibirsk, Russia.

CAMEL'S HAIR AND GOAT CLOTHS.

Report. — Cloths woven of goat and camel hair, in natural colors.

Poliakof Bros., Moscow, Russia.

FANCY DRESS GOODS.

Report. — Very creditable fancy dress goods, in good qualities and moderate prices.

V. N. Soovirof, Tooshim, Moscow, Russia.

WOOLLEN CLOTHS.

Report. — Black and colored cloths, of medium qualities, for general use.

Shelaief Bros., Moscow, Russia.

SATINS.

Report. — Plain black and colored cotton-back satins, of excellent manufacture.

John Sytof, St. Petersburg, Russia.

GOLD DAMASKS.

Report. — Silk and velvet brocades, and velvets made of silk, silver, and gold, of great beauty in design and excellent manufacture; also, trimming of the same materials.

Michael Borodin, Moscow, Russia.

GAUZES.

Report. — A fine exhibit of gauzes and fancy dress goods, in very good taste and of perfect execution.

Mosjookhin & Sons, Moscow, Russia.

DAMASKS AND BROCADES.

Report. — A fine display of rich furniture silk damasks, of great perfection in the execution.

Alexander Timasheff, Moscow, Russia.

GAUZES.

Report. — A large display of striped and fancy gauzes, very well made.

F. A. Jevarjeief, St. Petersburg, Russia.

SILVER AND GOLD FABRICS FOR CHURCH VESTMENTS.

Report. — A magnificent display of sacerdotal vestments, made of silver and gold tissues, of excellent execution, preserving the traditional splendor of the Greek Church.

S P A I N .

Antonio Pascual & Co., Reus, Tarragona, Spain.

BLACK SILKS.

Report. — Black silks, of good manufacture, color, and finish.

Sons of Oñate, Valencia, Spain.

RAW SILK AND COCOONS.

Report. — An excellent assortment of silk cocoons and raw silk, entitled to the highest commendation.

Faustino Martinez, Seville, Spain.

RAW SILKS.

Report. — A very good show of cocoons, also, excellent raw silk, of great purity and elasticity.

Farriols & Son, Barcelona, Spain.

BLACK SILKS.

Report. — A great variety of black cashmere silks, in fine grades, of excellent manufacture in every respect.

Benito Malrehy, Barcelona, Spain.

SILK DAMASKS AND BROCADES.

Report. — A great variety of curtain and furniture silk damasks and brocades and trimmings, of good colors and excellent manufacture.

Eduardo Reig & Co., Barcelona, Spain.

SILK CRAVATS AND FICHUS.

Report. — Good assortment of silk neck-handkerchiefs, well made, and very effective for the price.

Serret Y. Turull, Barcelona, Spain.

SHAWLS AND BLANKETS.

Report. — Shawls and blankets, of good qualities.

José Jordá & Son, Alcoy, Alicante, Spain.

WOOLLEN CLOTHS.

Report. — A collection of cheap fancy cassimeres.

Bresca & Co., Barcelona, Spain.

MERINO.

Report. — Merinos and merino shawls, of good qualities.

Joaquin Casanovos & Son, Sabadell, Barcelona, Spain.

WOOLLEN CLOTHS.

Report. — A good collection of fancy cassimeres, at low prices.

Maiquez & Tomás, Valencia, Spain.

MANTLE CLOTHS.

Report. — Spanish mantles, of original designs.

Juan Sallares & Son, Sabadell, Barcelona, Spain.

WOOLLEN CLOTHS.

Report. — Fancy cassimeres in creditable qualities and moderate prices.

Rodriguez Brothers, Bejar, Salamanca, Spain.

WOOLLEN CLOTHS.

Report. — Black and colored cloths, in creditable qualities, at low prices.

Yarrat & Sociats, Ternel, Spain.

WOOLLEN CLOTHS.

Report. — Colored cloths, of good qualities and colors, at low prices.

Francisco Sanchez, Sevilla, Spain.

GOLD BRAIDS.

Report. — A good assortment of gold braids, of very creditable manufacture.

Sert Brothers & Solá, Barcelona, Spain.

WORSTED GOODS.

Report. — A large display of dress goods, upholstering materials, shawls, blankets, carpets, and plushes, in great variety of qualities, and good designs.

S W E D E N.

K. A. Almgren, Stockholm, Sweden.

SILKS.

Report. — Colored failles, very well made, from the best material, and of brilliant lustre.

Bergsbro Manufacturing Co., Norrköping, Sweden.

CASSIMERES.

Report. — Fancy cassimeres, of excellent manufacture and design.

Drag Manufacturing Co. (Limited), Norrköping, Sweden.

FANCY CASSIMERES AND OVERCOATINGS.

Report. — Fancy cassimeres, ratiné, and other overcoatings, doeskins, and tricots, of superior manufacture and finish.

Malmö Woollen Manufacturing Co. (Limited), Malmö, Sweden.

CASSIMERES AND COATINGS.

Report. — Fancy cassimeres and worsted coatings, for general consumption, good for the cost of production.

The Society of Friends of Handiwork, Stockholm, Sweden.

CARPETS AND RUGS.

Report. — A beautiful exhibit of carpets and rugs, in the ancient traditional styles of the country of production, made by hand work.

S W I T Z E R L A N D.

Baumann, aelter, & Co., Zurich, Switzerland.

SILKS.

Report. — Commended for a high degree of perfection as to texture, regularity, beauty, and finish in fine goods.

S. Rutschi & Co., Zurich, Switzerland.

SILK GOODS.

Report. — Black and colored fabrics at very moderate prices, showing great care in the manufacture; the satin de Chine particularly well made.

Ryffel & Co., Staefa, Zurich, Switzerland.

SILKS.

Report. — The marcelines (satinets) exhibited are superior in texture, color, and finish, and can scarcely be excelled.

Emil Schaerer & Co., Zurich, Switzerland.

SILKS.

Report. — Commended for good taste in style and coloring; and for stripes, which are very regular in the manufacture, and show great progress.

J. Schwarzenbach-Landis, Thalweil, near Zurich, Switzerland.

SILKS.

Report. — For colored failles and changeables, of great regularity and beauty, at moderate prices, well adapted for the best markets.

Joh. Stapfer's Sons, Horgen, Zurich, Switzerland.

SILKS.

Report. — An exhibit of great merit, evincing considerable progress in the manufacture of plain, striped, and checked silk goods, of perfect taste, at low prices.

Stunzi & Sons, Horgen, Zurich, Switzerland.

SILK GOODS.

Report. — Cotton-back satins, which, in price, compare favorably with the best products of other countries.

Jansen, Bodek, & Hertz, Riesbach, near Zurich, Switzerland.

SILK GOODS.

Report. — Good styles of cravat materials, at low prices.

Adlischweil Silk Goods Factory, Adlischweil, near Zurich, Switzerland.

SILK GOODS.

Report. — Black and colored failles and taffetas, which are remarkably well made for the price, and on that account are calculated for a large and general consumption.

Winterthur Silk Goods Factory, Winterthur, Switzerland.

SILK GOODS.

Report. — A fine and varied assortment of all grades; power-loom

umbrella silks, which are well adapted for the purpose intended; also, good black cotton-back satins.

Dufour & Co., Thal, Switzerland.

SILK BOLTING CLOTH.

Report. — Bolting cloth, of good manufacture, well adapted for the purpose.

St. Siegenthaler, Enggistein, Switzerland.

FELTS.

Report. — A good collection of felts for shoes and hats, for general use, and at moderate prices.

Meyer Brothers, Zurich, Switzerland.

BOLTING CLOTH.

Report. — Bolting cloth of great regularity and perfection of quality.

Heidegger, Negmann, & Co., Seefeld, Switzerland.

SILK BOLTING CLOTH.

Report. — Bolting cloth, remarkable in all grades for superior manufacture and regularity.

Egli & Sennhauser, Zurich, Switzerland.

BOLTING CLOTH.

Report. — Bolting cloth in great variety, evenly and well made.

Reiff-Huber, Zurich, Switzerland.

BOLTING CLOTH.

Report. — A large variety of bolting cloth, deserving special merit for great perfection in their manufacture.



TASMANIA.



J. Brock, Campania, Tasmania.

MERINO WOOL.

Report. — Fleece of pure merino and growth.



George W. Keach, Chiswick, Ross, Tasmania.

WOOL.

Report. — A fleece of four-years'-old rani, and one of five-years'-old ewe; wool of good quality, and adapted for combing.

David Taylor, St. Johnstone's, Tasmania.

MERINO WOOL.

Report. — Fleeces of pure merino wool, in the grease, all of superior quality and merit.

Charles Headlain, Egleston, Tasmania.

MERINO WOOL.

Report. — Fleeces of pure merino wool, of excellent quality, staple, and fibre.

Samuel Page, Bellevue, New Town, Tasmania.

MERINO WOOL.

Report. — Fleeces of pure merino hot-water-washed wool, all of superior quality and excellent growth.

Frederick Shaw, Redbanks, Swansea, Tasmania.

LEICESTER WOOL.

Report. — One fleece of Leicester wool, of excellent quality and growth.

Wm. H. Gibson, Fairfield, Snake Banks, Tasmania.

MERINO WOOL.

Report. — For fleeces of pure merino raw wool, of superior quality and staple.

John Taylor, Milford, Campbell Town, Tasmania.

MERINO WOOL.

Report. — Washed and skirted yearling merino ewe wool, of first-rate quality, adapted for the manufacture of the finest goods.

W. Gibson & Son, Scone, Perth, Tasmania.

MERINO WOOL.

Report. — Fleeces of pure merino ram, ewe, and hogget wool, all of excellent quality, and of the highest merit.

George Wilson, Oatlands, Tasmania.

MERINO WOOL.

Report. — Several fleeces of fine merino wool, of excellent quality, well bred, and of good staple, weighing about eleven and a half pounds each.

James Gibson, Bellevue, Cleveland, Tasmania.

MERINO WOOL.

Report. — Fleeces of pure merino, ram, ewe, and lamb's wool, all of excellent quality and growth.

W. H. D. Archer, Brickendon, Longford, Tasmania.

WOOL.

Report. — Samples of pure merino and lamb's wool, all of excellent quality and growth.

George Taylor, Milford, Campbell Town, Tasmania.

MERINO WOOL.

Report. — Several very superb fleeces from stud merino ram, valuable for length of fibre and adaptation for the manufacture of the best merinos and cashmeres.

W. S. Sharland, Woodbridge, New Norfolk, Tasmania.

WOOL.

Report. — Fleeces of pure merino wool, of good quality, fibre, and staple.

John Ralston, Logan, Evandale, Tasmania.

WOOL.

Report. — Several fleeces of pure merino wool, of good quality and growth; also, Leicester fleeces, of very good length, staple, and quality, highly creditable to the grower.

Thos. Parramore, Beaufort, Ross, Tasmania.

MERINO WOOL.

Report. — Several fleeces of wool from pure merino ram and ewes, of very superior quality and staple.

T U R K E Y .

Madame Elbis, Constantinople, Turkey.

SILK EMBROIDERY.

Report. — Curiously-wrought silk embroidery, showing great skill and taste.

Nicholas Bolad, Damascus, Turkey.

STRIPED AND FIGURED SILKS.

Report. — Striped and figured silks, of good taste, in good colors and combination of materials.

Emanuel G. Marridas, Kjopler, near Brousse, Turkey.

RAW SILK.

Report. — A remarkable display of white and yellow raw silk of great beauty and tenacity.

E. P. Schilizzi, Adrianople, Turkey.

RAW SILK.

Report. — Very fine, clean, and strong, white and yellow raw silk.

Merouk Oglou, Brousse, Turkey.

SILK GOODS.

Report. — Very well made, and of good texture.

Hadji Hakin Brothers, Aleppo, Turkey.

SILK GOODS.

Report. — White and gold damask of beautiful workmanship.

Imperial Silk Manufactory of Hiereke, Turkey.

SILK FABRICS.

Report. — A superb display of rich brocade silks, excellent in design, color, and execution.

The Imperial Ottoman Government, Constantinople, Turkey.

COLLECTIVE EXHIBITION OF SILK GOODS.

Report. — Commended for an excellent and very complete display of the silk, gold, and mixed fabrics of the Ottoman Empire, collected from the various places of manufacture, and deserving the highest merit for

taste and workmanship; also, for a splendid display of carpets, of great beauty of design, harmony of colors, and excellent manufacture.

Usni Hadji, Brousse, Turkey.

FELTS.

Report. — Felts of excellent quality.

Mehmed Erwin, Constantinople, Turkey.

FURNITURE BROCADES.

Report. — A great display of divan figured velvets, of rich design and good execution.

Giorgi Melouk, Damascus, Turkey.

GOLD-FIGURED VESTMENTS.

Report. — Rich damask mantle, of great beauty in material, design, and execution.

P. de Andria & Co., Smyrna, Turkey.

CARPETS.

Report. — A splendid collection of Turkish carpets, excellent in style and quality.

Said Effendi, Sivas, Turkey.

CARPETS.

Report. — Turkish carpets, of beautiful designs.

Edver, Diarbekir, Turkey.

CARPETS.

Report. — Turkish carpets, of distinguished styles.

Mehmet Ogion, Alichan, Turgosklou, Turkey.

CARPETS.

Report. — Turkish carpets, very well made in every respect.

Mohamet, Angora, Turkey.

CARPETS.

Report. — Commended for excellence of quality and very fine combination of colors of Turkish carpets.

SUPPLEMENT TO GROUP IX.

Reports of Judges on Appeals.

JOHN FRITZ	Bethlehem, Pa.
CHARLES STAPLES, JR.	Portland, Me.
BENJ. F. BRITTON	New York City.
EDWARD CONLY	Cincinnati, Ohio.
Prof. HENRY H. SMITH	University of Pennsylvania, Philadelphia, Pa.
M. WILKINS	Harrisburg, Oregon.
Gen. HENRY K. OLIVER	Salem, Mass.
COLEMAN SELLERS	Philadelphia, Pa.
JAMES L. CLAGHORN	"
Prof. S. F. BAIRD	Washington, D. C.

1. Sanford Mills, Sanford, Me., U. S.

LAP ROBES.

Report.—Commended for excellence in color and general finish, fitness for purpose, together with economy in cost.

2. French & Co., Norwich, England.

NORWICH CRAPE, IN SINGLE, DOUBLE, AND TREBLE.

Report.—Commended for a high degree of excellence in texture and finish.

3. Wilhelm Schröder & Co., Zurich, Switzerland.

SILKS.

Report.—A large display of dress silks, excellent in texture and color.

4. Homberger Brothers, Wetzikon, Switzerland.

SILK BOLTING CLOTH.

Report.—Commended for uniformity in texture and fitness for purpose intended.

5. Baumann & Streuli, Horgen, Switzerland.

DRESS SILKS, CHANGEABLE COLORS.

Report.—Commended as excellent in color and texture.

6. Jose Marie Casqueiro Crato, Portalegre, Portugal.

WOOL.

Report.—Washed wools, of good quality.

7. Devoosse-Blaise, Disen, Belgium.

CASSIMERES.

Report. — Good fabrics, excellent in design and finish.

8. M. Wihl & Co., Verviers, Belgium.

CASSIMERES.

Report. — A good display in various weights, excellent in color and designs.

9. Campos Mello & Co., Covilhan, Portugal.

CASSIMERES.

Report. — Commended for fancy cassimeres, of good fabrication and neat designs.

10. Padronello Woollen Fabrics Co., Amarante, Portugal.

CASSIMERES, OVERCOATINGS, AND SHAWLS.

Report. — Commended for a large display of excellent fabrics, tastefully designed.

11. Antonio Jose Pereira da Silva Alves, Oporto, Portugal.

SEWING SILK.

Report. — Commended for uniform twist and superior strength.

12. Franzi Brothers, Alzano Maggiore, Italy.

SILK.

Report. — A good exhibit in tram, organzine, and twist, well prepared, and excellent in general finish.

13. Eduardo Augusto Pereira, Meixomil, Oporto, Portugal.

WOOLS.

Report. — An exhibit of wools, washed and in the grease, of good quality and staple.

14. The Colony of the Cape of Good Hope.

WOOLS.

Report. — A collection of samples, indiscriminately selected from bales for export, showing excellent merino and Angora wools.

15. T. L. Davidson, Salem, Oregon, U. S.

MERINO WOOL.

Report. — Commended for fine staple, together with good strength.

16. **Ferdinando Ibanez Palenciano, Valencia, Spain.****SILKS, BROCADE, AND DAMASK.**

Report. — Commended for good design and workmanship of hand-made silks of old Moorish and Oriental styles.

**SIGNING JUDGE OF SUPPLEMENT TO
GROUP IX.**

The figures annexed to the name of the judge indicate the reports written by him.

Benj. F. Britton, — 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15.

Coleman Sellers. — 16.

A D D E N D A.

Joh. Schwarz & Son, Vienna, Austria.

HATTERS' RIBBONS.

Report. — Specialty of hatters' ribbons, very clearly and neatly made, first-rate in manufacture in every respect.

J. G. McGee & Co., Belfast, Ireland.

RUGS AND WRAPS.

Report. — A very handsome assortment of rugs and travelling wraps, made chiefly of mohair, silk, and wool, in imitation of real furs, otter, sealskins, and beavers, all of superior merit and beautiful combinations.

AMERICAN AWARDS.

GROUPS X. AND XIII.*



J. Dickson & Co., Philadelphia, Pa.

ENGRAVING ON VULCANIZED RUBBER.

Report. — Commended for invention, utility, economy, and cost.

John J. Glazier, Brother, & Co., Philadelphia, Pa.

HOSIERY.

Report. — Commended for a large assortment of white and colored "circular" frame hose, and half hose, and high degree of excellence in bleach and finish.

Christian Nonenberger, Philadelphia, Pa.

HATTERS' BLOCKS AND TOOLS.

Report. — Commended for variety and general utility, and adaptability to the purpose intended.

John B. Stetson & Co., Philadelphia, Pa.

SOFT AND STIFF FELT HATS.

Report. — Commended for fine material used, variety in styles, and fine workmanship.

Joel Thomas, Philadelphia, Pa.

RUCHES, LADIES' AND INFANTS' CAPS, RUFFLINGS, AND COLLARETTES.

Report. — Commended for fitness and cheapness; 200 various patterns, well made, and very moderate prices.

Allen, Lane, & Scott, and J. W. Landerbach, Philadelphia, Pa.

AN ILLUSTRATED BOOK, "A CENTURY AFTER."

Report. — The engraving and printing of this beautiful book were done in the offices of the firm, and are all first-class in quality, bearing witness to the proficiency of the members of the firm in the branch of book-making which each represents.

* Comprising some of the leading awards in the groups named.

J. M. Armstrong & Co., Philadelphia, Pa.

MUSIC TYPOGRAPHY.

Report. — Commended for clean cut and clearness of type-work in all the varieties of the exhibit.

Aiken, Lambert, & Co., New York.

GOLD PENS, CASES, AND PEN-HOLDERS.

Report. — Commended for solidity of construction, novelty and beauty of design; especially for the arrangement of the movement in the pencil and pen case by which the pencil is carried forward and the pen retired by one action.

George Bruce's Son & Co., New York City,

PRINTING TYPES.

Report. — Commended as book and newspaper type of great hardness, for beauty of design, — especially in kerned and ornamental type for imitating engraving. Besides the type shown, a specimen-book, embracing a large variety of plain and ornamental types, bore testimony to the good taste of the firm in their general manufacture.

Campbell Printing Press and Manufacturing Company, New York.

PRINTING PRESSES.

Report. — The art, book, news, and country presses are well made, and adapted to the work for which they are intended, and capable of doing good work.

Chambers Brothers, Philadelphia, Pa.

NEWSPAPER-FOLDER, PASTER, AND TRIMMER; AND PERIODICAL FOLDER, PASTER, AND TRIMMER.

Report. — The newspaper-folder, well made, and thoroughly well designed, and adapted for printers having a newspaper with a moderate circulation.

The periodical folder can be worked at a speed of 1,000 per hour, and does the work very efficiently.

A. M. Collins, Son, & Co., Philadelphia, Pa.

CARDS.

Report. — Bevel-edge cards for "glacé" pictures, card mounts with border lines and scroll-work, illuminated back of carte-de-visite mounts; all tasteful in design, of good quality, and superior workmanship.

Cottrell & Babcock, 8 Spruce Street, New York.

STOP-CYLINDER PRINTING-PRESS.

Report. — An exceedingly well-made machine, finished with great care, and well designed for securing the accurate working of all the bearings; very full and perfect distribution, with the strongest ink; well adapted for printing the finest illustrated works.

M. Gally, New York City.

SMALL PRINTING-PRESSES, ONE-HALF SHEET AND ONE-EIGHTH MEDIUM.

Report. — These presses combine the advantages of both the cylinder and platen motion. The direct action of the platen, with a full rest for laying on the paper, coupled with the perfect control of the operator over the inking, enable these presses to turn out very good work. They are so strongly made that they can be used for embossing cameo dies in color.

Gavit Paper Machine Works, Philadelphia, Pa.

PAPER-MAKING MACHINERY.

Report. — Commended for the patent cone pulley paper-cutter, which enables the machine to run at a high rate of speed; the open press roll stands being very convenient in putting on and taking off felts; also the improved deckle frame, whereby the deckles may be removed from the machine more conveniently, and with less liability to injure the wire-cloth; also an improvement known as the one-arm pulp dresser. Commended for convenience, strength, and durability, and ability to meet the demand for running a paper machine at a high rate of speed. Also, for a stack of web super colenders which combines strength, finish, and economy in cost.

George P. Gordon, New York City.

JOB-PRINTING PRESSES.

Report. — Commended as simple in construction, with good rest on impression, and full time for laying on the paper; excellent distribution insured by division of inking-table in two circles revolving in opposite directions.

W. W. Harding, Philadelphia, Pa.

BIBLES AND ALBUMS, PAPER-MAKING, PRINTING, AND BOOK-BINDING.

Report. — The Bibles shown in this exhibit are the product of the

paper-mills, printing-office, and book-bindery of the exhibitor ; and the work in each department is first-class of its kind, and the prices reasonable. The photograph albums with a so-called "chain back" are a notable feature of this exhibit.

A. J. Holman & Co., Philadelphia, Pa.

BOOK-BINDING OF BIBLES AND ALBUMS.

Report. — This exhibit is especially noteworthy for the beauty and variety of Bibles and photograph albums displayed. The printing of the Bibles is admirably done, and the binding of both Bibles and albums is varied with good taste, to meet the wants of customers ; the prices of all being extremely reasonable.

Howlett, Onderdonk, & Co., Philadelphia, Pa.

MACHINE-MADE PAPER BAGS.

Report. — Commended for convenient shape, uniformity of manufacture, good workmanship, and economy in cost.

Ignatius Kohler, Philadelphia, Pa.

BOOK-BINDING.

Report. — Remarkable specimens of hand-tooled book-binders' work.

J. B. Lippincott & Co., Philadelphia, Pa.

BOOK-BINDING AND PRINTING.

Report. — This exhibit is remarkable for its wide range in book-making, apparently covering the entire field, including blank-books of great merit, school, law, medical, theological, and miscellaneous books ; furnishing examples of almost every desirable style of printing and binding, and showing in both the typography and binding great fertility in designing, and consummate art in the execution of printers' and binders' work.

W. E. & E. D. Lockwood, Philadelphia, Pa.

AUTOMATIC ENVELOPE MACHINE.

Report. — Deserving great commendation for originality of design and construction. The only machine exhibited that cuts the envelopes from the web of paper. It produces the envelopes complete and ready for use, at the rate of 120 per minute, on an improved economic principle.

An automatic seed-bag envelope machine, working at the rate of seventy-five per minute, with good result.

Gustav L. Jaeger, 69 & 71 Wooster Street, New York City.

**MACHINE FOR PASTING AND COMBINING PAPER OR TEXTILE FABRICS
IN SHEETS.**

Report. — A very compact machine for making two-sheet paste-boards, or combining paper with textile fabric for paper-collar work, or cloth-lined paper for envelopes, &c. The design and arrangement very practical, and indicating great care in construction. Although the exhibitör was unable to secure the space necessary for showing the drying cylinders in operation, we have no hesitation in recommending the whole machine for award.

MacDonnell & Co., Philadelphia, Pa.

PRINTERS' ROLLERS.

Report. — The composition carefully prepared, and well adapted for the purpose intended; cast in blocks for easy transmission to country printers. Rollers in exhibit thoroughly well cast.

MacLachlan, Hopkins, & Co., New York.

PAGING AND NUMBERING MACHINES.

Report. — Commended for simplicity, ease of running, facility for adjusting different sizes of figures, and general adaptation for the work for which they are designed. The double-head machine is arranged to number both check and its counterpart at one blow; or it will, at the same time, number two coupons. The cylinders on the paging-machine are, with great facility, changed to print large or small figures; and both machines are conveniently arranged for disposing of sheets of paper after they are numbered.

W. F. Murphy's Sons, Philadelphia, Pa.

BLANK-BOOKS.

Report. — It is evident that the most careful attention is paid to the minutest detail in the work shown in this exhibit, resulting in the highest degree of excellence; while the prices are moderate, thereby appreciating and meeting the demands of the public.

Bennet Osborn, Newark, N. J.

PAPER BOXES.

Report. — Commended for originality, ability, fitness for the purposes intended, and adaptation to public want.

Porter & Coates, Philadelphia, Pa.

BOOKS.

Report. — Commended for the originality of design in styles of binding, the great beauty of the printing of the illustrated books, and the general excellence of the mechanical execution of the entire collection; the binding being specially noteworthy as combining beauty with durability.

Samuel Raynor & Co., New York.

ENVELOPES OF EVERY VARIETY OF QUALITY, FORM, AND SHAPE.

Report. — Commended for the greatest variety of envelopes in quality, form, and shape; more than twelve hundred different sorts being manufactured by the exhibitors; produced from paper manufactured from jute, rope, manilla, wood, rag, linen; also, parchment and cloth lined. All well made and well gummed.

Daniel M. Somers, now Somers Brothers, Brooklyn, New York.

PEN-HOLDERS.

Report. — Commended for novelty in many of the designs, good workmanship, superior finish, and reasonable price.

J. M. Stoddart & Co., Philadelphia, Pa.

BOOKS.

Report. — Commended because that, in the combination of steel-plate printing and letter-press, as shown in the "Gallery of Famous Poets" and the "Gallery of Famous Women," books of rare typographical beauty are produced; the printing, binding, and paper being apparently faultless. Great credit is also due to the publishers for furnishing, in such handsome styles and at moderate prices, such valuable books as "The Encyclopædia Britannica," and Hogarth's works.

John Wanamaker & Co., Philadelphia, Pa.

CIVIL AND MILITARY CLOTHING.

Report. — Commended for fair skill in cut and workmanship, and as meritorious in price.

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